



## Data Article

# Survey data of public awareness on climate change and the value of marine and coastal ecosystems



Catarina Fonseca<sup>a,b,\*</sup>, Louisa E. Wood<sup>c</sup>, Mialy Andriamahefazafy<sup>c,d</sup>, Gema Casal<sup>e</sup>, Tomas Chaigneau<sup>f</sup>, Cindy C. Cornet<sup>c</sup>, A. Karima Degia<sup>g</sup>, Pierre Failler<sup>c</sup>, Gianluca Ferraro<sup>c</sup>, Elisa Furlan<sup>h</sup>, Julie Hawkins<sup>i</sup>, Silvia de Juan<sup>j</sup>, Torsten Krause<sup>k</sup>, Tim McCarthy<sup>e</sup>, Géraldine Pérez<sup>l</sup>, Callum Roberts<sup>i</sup>, Ewan Trégarot<sup>c</sup>, Bethan C. O'Leary<sup>i,m</sup>

<sup>a</sup> cE3c – Centre for Ecology, Evolution and Environmental Changes, Azorean Biodiversity Group, CHANGE – Global Change and Sustainability Institute, Faculty of Sciences and Technology, University of the Azores, Ponta Delgada 9500-321, Portugal

<sup>b</sup> CICS.NOVA - Interdisciplinary Center of Social Sciences, Faculty of Social Sciences and Humanities (FCSH/NOVA), Lisboa 1070-312, Portugal

<sup>c</sup> Centre for Blue Governance, Faculty of Business and Law, University of Portsmouth, Richmond Building, Portland Street, Portsmouth PO1 3DE, UK

<sup>d</sup> Geneva Science-Policy Interface, University of Geneva, Uni Mail, Boulevard du Pont-d'Arve 28, Geneva CH-1211, Switzerland

<sup>e</sup> National Centre for Geocomputation, Maynooth University, Co. Kildare, Maynooth, Ireland

<sup>f</sup> Environment and Sustainability Institute, Faculty of Environment, Science and Economy, University of Exeter, Penryn Campus, Penryn TR10 9FE, UK

<sup>g</sup> Centre for Resource Management and Environmental Studies, University of the West Indies, Cave Hill Campus, Barbados

<sup>h</sup> Centro Euro-Mediterraneo sui Cambiamenti Climatici and Università Ca' Foscari Venezia, CMCC@Ca'Foscari – Edificio Porta dell'Innovazione, 2nd floor – Via della Libertà, 12, Venice 30175, Italy

<sup>i</sup> Department of Ecology & Conservation, Faculty of Environment, Science and Economy, University of Exeter, Penryn Campus, Penryn TR10 9FE, UK

<sup>j</sup> Mediterranean Institute for Advanced Studies (IMEDEA CSIC-UIB), C/ Miquel Marqués 21, Balearic Islands, Esporles 07190, Spain

<sup>k</sup> Lund University Centre for Sustainability Studies, P.O. Box 170, Lund 221-00, Sweden

<sup>l</sup> Institut océanographique Paul Ricard, Île des Embiez - 83140 Six-Fours-les-Plages, France

\* Corresponding author at: cE3c – Centre for Ecology, Evolution and Environmental Changes, Azorean Biodiversity Group, CHANGE – Global Change and Sustainability Institute, Faculty of Sciences and Technology, University of the Azores, Ponta Delgada 9500-321, Portugal.

E-mail address: [catarina.im.fonseca@uac.pt](mailto:catarina.im.fonseca@uac.pt) (C. Fonseca).

Social media: [@CatarinaFonseca](https://twitter.com/CatarinaFonseca) (C. Fonseca), [@gemcasal](https://twitter.com/gemcasal) (G. Casal), [@cindycornet](https://twitter.com/cindycornet) (C.C. Cornet), [@sdejuan](https://twitter.com/sdejuan) (S. de Juan), [@DrTorstenKrause](https://twitter.com/DrTorstenKrause) (T. Krause), [@Geraldine\\_PeHo](https://twitter.com/Geraldine_PeHo) (G. Pérez), [@Ewan\\_Tregarot](https://twitter.com/Ewan_Tregarot) (E. Trégarot), [@bethancoleary](https://twitter.com/bethancoleary) (B.C. O'Leary)

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## ABSTRACT

The long-term provision of ocean ecosystem services depends on healthy ecosystems and effective sustainable management. Understanding public opinion about marine and coastal ecosystems is important to guide decision-making and inform specific actions. However, available data on public perceptions on the interlinked effects of climate change, human impacts and the value and management of marine and coastal ecosystems are rare. This dataset presents raw data from an online, self-administered, public awareness survey conducted between November 2021 and February 2022 which yielded 709 responses from 42 countries. The survey was released in four languages (English, French, Spanish and Italian) and consisted of four main parts: (1) perceptions about climate change; (2) perceptions about the value of, and threats to, coasts, oceans and their wildlife, (3) perceptions about climate change response; and (4) socio-demographic information. Participation in the survey was voluntary and all respondents provided informed consent after reading a participant information form at the beginning of the survey. Responses were anonymous unless respondents chose to provide contact information. All identifying information has been removed from the dataset. The dataset can be used to conduct quantitative analyses, especially in the area of public perceptions of the interlinkages between climate change, human impacts and options for sustainable management in the context of marine and coastal ecosystems. The dataset is provided with this article, including a copy of the survey and participant information forms in all four languages, data and the corresponding codebook.

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## Specifications Table

Subject	Social Sciences
Specific subject area	Online survey concerning public awareness of climate change, human impacts and the value and management of marine and coastal ecosystems.
Type of data	xlsx, PDF, txt
How the data were acquired	The data were collected through an online survey released in English, French, Spanish and Italian and administered using Qualtrics (a survey platform). Some question items included in the first section were derived from those used by the European Social Survey (ESS) Round Eight (dedicated module on "Public Attitudes to Climate Change, Energy Security, and Energy Preferences") [8]. Other question items were designed exclusively for this survey. Before opening the survey to public responses, it was piloted to ensure it was easy to understand and complete.
Data format	Raw, Excel (xlsx) file, partially filtered for reasons of confidentiality, responses are provided in English. Codebook, notepad file. Survey text, pdf – one for each language (English, French, Spanish and Italian). Participant Information Form, pdf – one for each language (English, French, Spanish and Italian).

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Description of data collection	Data were collected through a self-administered online survey in four languages (English, French, Spanish and Italian) hosted on Qualtrics between November 2021 and February 2022. Dissemination was by email and social media, targeting groups directly that represent individuals interested in marine and coastal ecosystems within Northern Europe, the Western Mediterranean and the Lesser Antilles.
Data source location	An online survey supplied respondents who represented 42 countries. Data were collected by: Institution: University of Exeter City/Town/Region: Penryn, Cornwall Country: UK
Data accessibility	Repository name: Mendeley Data Data identification number: DOI: <a href="https://doi.org/10.17632/t82xdzpdh8.2">10.17632/t82xdzpdh8.2</a> Direct URL to data: <a href="https://data.mendeley.com/datasets/t82xdzpdh8/2">https://data.mendeley.com/datasets/t82xdzpdh8/2</a>

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## Value of the Data

- The dataset contains information on public perceptions about climate change, the value of marine and coastal ecosystems, human impacts on them and their management in addition to socio-demographic characteristics from 709 respondents across 42 countries.
- The data could serve as the basis for future studies and help provide an indication of the level of awareness and attitudes of people about the interlinkages among climate change and its effects on marine and coastal ecosystems and options for their sustainable management, particularly in countries with larger and more representative respondent samples or as a general dataset.
- The data could be used for educational and research purposes in terms of short courses, training or as a guide for similar global surveys, as well as more targeted surveys in local contexts, in the future.

## 1. Objective

Hundreds of millions of people worldwide rely on marine and coastal ecosystems for their food, livelihoods and ways of life [1]. Nonetheless, these ecosystems are under a variety of pressures [2,3] making sustainable management ever more important in order to maintain the crucial ecosystem services they provide. Climate change is a major pressure and one of the most urgent challenges society currently faces [4]. Policy makers are increasingly aware of the adverse effects climate change and environmental degradation have on our coastal and marine ecosystems [2–4]. However, understanding people’s views about climate change impacts on marine and coastal systems and potential responses, alongside other threats and societal challenges is critical because it can influence decision-making and steer future actions [5]. The survey presented here was conducted to better understand public perceptions of climate change, human impacts and the value and management of marine and coastal ecosystems.

## 2. Data Description

The self-administered online survey was released in four languages, English, French, Spanish and Italian: the survey text is available for all four languages in Mendeley Data as “Survey\_EN.pdf”, “Survey\_FR.pdf”, “Survey\_SP.pdf”, “Survey\_IT.pdf” [6]. These show the design of the survey which comprised questions on (1) perceptions about climate change; (2) perceptions about the value of, and threats to, coasts, oceans and their wildlife, (3) perceptions about climate change responses; and (4) socio-demographic information. Prior to completing the survey, potential respondents were provided with a participant information form to inform consent:

these are available for all four languages as “PIF\_EN.pdf”, “PIF\_FR.pdf”, “PIF\_SP.pdf”, “PIF\_IT.pdf” [6].

The final dataset comprises a total of 709 respondents. For reasons of confidentiality, data were anonymised by removing all fields that would enable personal identification. The dataset is provided in Mendeley Data as “Survey\_Fonsecaetal\_07122022.xlsx” [6]. The dataset contains mostly numerical coding, except text entries in 9 columns which contain responses in English (responses provided in other languages have been translated) The corresponding codebook (“Codebook\_Fonsecaetal\_24112022.txt”) provides the questions in English and coding information” [6].

### 3. Experimental Design, Materials and Methods

The online survey was open for response from 16th November 2021 until 16th February 2022 on the online platform Qualtrics [7] with the survey screen optimised based on the device used. It was made available in four languages: English, French, Spanish and Italian, the languages of the European Commission H2020 funded research project on “Marine Coastal Ecosystems Biodiversity and Services in a Changing World” (MaCoBioS). The survey targeted individuals interested in marine and coastal ecosystems, climate change and ecosystem management. In particular, it aimed to target those stakeholders who mostly interact with marine and coastal ecosystems in one of the following ways: (1) tourism and/or recreation; (2) conservation, management and/or scientific advice; and (3) fishing and/or seafood production. Before opening the survey to public responses, it was piloted on a sample of 20 respondents to ensure it was easy to understand and complete.

The survey was composed of 20 questions across four main parts: (1) perceptions about climate change; (2) perceptions about the value of, and threats to, coasts, oceans and their wildlife; (3) perceptions about climate change response; and (4) socio-demographic information. Some question items included in the first section were derived from those used by the European Social Survey (ESS) Round Eight (dedicated module on “Public Attitudes to Climate Change, Energy Security, and Energy Preferences”) [8]. Adaptation of the question items is shown in Table 1. Other question items were designed exclusively for this survey, in line with the project’s aims and objectives.

**Table 1**

Adaptation of question items from the European Social Survey and rationale.

Question wording in ESS8–2016	Question wording in MaCoBioS survey	Rationale for adaptation
(D19) You may have heard the idea that the world’s climate is changing due to increases in temperature over the past 100 years. What is your personal opinion on this? Do you think the world’s climate is changing?	(1.) Do you think the world’s climate is changing?	Part of the ESS8–2016 wording was considered unnecessary given the introductory text of the MaCoBioS survey.
(D22) Do you think that climate change is caused by natural processes, human activity, or both?	(2.) Based on your understanding, which of the following best describes what is most responsible for causing climate change?	Rewording was suggested after piloting to ensure it was not leading the response. It also aimed to harmonize language used in the survey and to facilitate translation.
(D24) How worried are you about climate change?	(4.) How concerned are you about climate change?	Rewording aimed to harmonize language used in the survey and to facilitate translation.

**Table 2**

List of stakeholder organisations contacted for survey dissemination by country and sector (conservation, tourism/recreation, fishing/seafood). Organisations were emailed and contacted via social media (where they had a presence) and were asked to share the survey with their member groups. Organisations were contacted in the language most relevant based on the survey translations available (English, French, Spanish and Italian).

Country/ Territory	Stakeholder groups targeted by sector		
	Conservation	Recreation	Fishing/seafood
England (UK)	Marine Conservation Society	British Sub-Aqua Club	National Federation of Fishermen's Organisation
	Royal Society for the Protection of Birds	Angling Trust	Shellfish Association of Great Britain
	Blue Marine Foundation	Royal Yachting Association	Seafish
	World Wildlife Fund - UK Wildfowl & Wetlands Trust	British Marine British Spearfishing Association	Seagrown New Under Ten Fishermen's Association
Republic of Ireland	Irish Environmental Network	Irish Underwater Council	Irish Fish Producers Organisation
	Sustainable Water Network	Irish Marine Federation	Irish Fishing & Seafood Alliance
	BirdWatch Ireland Coastwatch Ireland	Angling Council for Ireland Irish Charter Skippers Association	Federation of Irish Fishermen Irish Fish Processors & Exporters Association
	Irish Wildlife Trust	Irish Sailing	Irish Farmers Association, Aquaculture Committee
Norway	The Norwegian Biodiversity Network	Norges Jeger- og Fiskerforbund	Norges Foskarlag
	Norges Naturvernforbund	Norges Dykkeforbund	Norwegian Seafood Council
	WWF Norway		
France	Sea Shepherd - France	Fédération Française d'études et de Sports Sous-Marins	Association pour la Pêche et les Activités Maritimes
	Bloom	Fédération Nationale de la pêche en France et de la Protection des milieux aquatiques	Comité Interprofessionnel des Produits de l'Aquaculture
	UICN Comité Français	Fédération Française des Pêcheurs en Mer	
	The SeaCleaners	Fédération Nationale de la Plaisance et des Pêches en mer	
	Ocean & Climate Platform	Fédération Française de Voile	
Italy	Legambiente	Federazione Italiana Attività Subacquee	Federazione Nazionale delle Imprese di Pesca
	WWF - Italy	Federazione Italiana Pesca Sportiva e Attività Subacquee	Associazione Generale Cooperative Italiane - Dipartimento Pesca
	UICN Comitato Italiano	Federazione Italiana Operatori Pesca Sportiva	Federazione Nazionale Cooperative della Pesca
	MareVivo	Federazione Italiana Vela	Legacoop agroalimentare - Dipartimento pesca
	Associazione Nazionale per la Tutela dell'Ambiente		Associazione Piscicoltori Italiani
Spain	UICN Comité Español	Federación Española de Actividades Subacuáticas	Federación Nacional de Cofradías de Pescadores
	Sociedad Española de Ornitología	Asociación de Buceo Recreativo de España	Confederación Española de Pesca
	WWF España	Alianza de Pesca Española Recreativa Sostenible	Asociación Empresarial de Acuicultura de España
	Fundación CRAM	Asociación de Pescadores Recreativos	
	Eco-union	Real Federación Española de Vela	

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**Table 2** (continued)

Country/ Territory	Stakeholder groups targeted by sector		
	Conservation	Recreation	Fishing/seafood
Bonaire	Dutch Caribbean Nature Alliance Reef Renewal Bonaire Sea Turtle Conservation Bonaire Stichting Nationale Parken Bonaire Echo Foundation	Dive Friends Bonaire  Tourism Corporation Bonaire	
Martinique	Carbet des Sciences  Association Le Carouge  Société Étude Protection et Aménagement de la Nature à la Martinique Association Pour la Sauvegarde du Patrimoine Martiniquais  Association pour la Protection De la Nature et de l'Environnement	Antilles Sub Diamond Rock  Martinique Surfing	Association pour le Développement de la Production Aquacole Martiniquaise Comité Régional des Pêches Maritimes et Elevages Marins de Martinique Coopérative des Aquaculteurs de Martinique  Fédération Départementale des Associations agréées pour la pêche et la protection des milieux aquatiques
Barbados	Future Centre Trust  Barbados Environmental Conservation Trust Barbados Marine Trust  Barbados National Trust Coral Reef Restoration Alliance	Barbados Hotel & Tourism Association Barbados Game Fishing Association Barbados Dive Operators Association Barbados Surfing Association Barbados Sailing Association	Barbados National Union of Fisherfolk Organisation

The survey was self-administered. Questions consisted of multiple-choice questions, demographic questions, and open-ended questions. Most questions were compulsory to answer however demographic questions asking for personal characteristics such as age, gender identity, and education contained an option 'prefer not to answer'. Questions included "I don't know" options or in many cases allowed respondents to provide their own response or select "None" of the provided options.

Prior to starting the survey, users were provided with a participant information form detailing information about the survey and asked to provide informed consent before they could proceed. We have used age as an exclusion criterion, requesting that participants are aged 18 years old or over to complete our questionnaire. This was specified in the participant information sheet and in the dedicated consent question. The demographic question in the survey about participant's age included an 'under 18' option as a double check.

Participation was entirely voluntary. Respondents were allowed to leave the survey and re-enter to finish it later. Incomplete survey responses were deleted after two weeks of inactivity from the last time they edited a response. Multiple responses from the same respondent were prevented by placing a cookie on the respondent's browser when they submitted a response. Data were anonymised with respondents' IP address, location data and contact information not recorded. However, respondents were provided the option to leave additional comments and their contact details: these have been removed from the dataset to maintain respondent

**Table 3**

Overview of respondent characteristics.

Characteristic	Values	Frequency (N = 709)	Values	Frequency (N = 709)
Country of residence	Australia	2	Kenya	4
	Austria	2	Madagascar	1
	Barbados	5	Mexico	1
	Belgium	4	Monaco	1
	Brazil	4	Netherlands	16
	Cameroon	1	Nicaragua	1
	Canada	6	Niger	1
	China	2	Norway	13
	Colombia	2	Other	1
	Djibouti	2	Panama	2
	Ecuador	1	Philippines	1
	Finland	4	Portugal	8
	France	134	Senegal	4
	Germany	14	Seychelles	1
	Ghana	1	South Africa	3
	Greece	1	Spain	50
	Guinea	2	Sweden	15
	Guyana	1	Switzerland	2
	Ireland	115	Turkey	13
	Italy	180	UK	75
Jamaica	2	USA	11	
Form of interaction with coasts and oceans	<i>I produce food through fishing and/or seafood production</i>	14	<i>Other (please specify)</i>	55
	<i>I am a tourist and/or recreational user</i>	376	<i>I provide tourism and/ or recreation services</i>	31
	<i>I am actively involved in conservation, management and/or scientific advice</i>	233		
Age (years)	<18	0	51–60	105
	18–30	216	>60	62
	31–40	185	Prefer not to answer but over 18	8
	41–50	133		
Gender identity	Female	360	Prefer to self-describe	2
	Male	336	Prefer not to say	11
Highest level of education	Did not attend school	0	Doctorate (e.g. PhD)	172
	High / secondary school or equivalent	66	Prefer not to answer	11
	Bachelor's degree (e.g. BA, BSc)	153	Other (please specify)	16
	Master's degree (e.g. MA, MSc, MEd)	291		

anonymity. The survey took an estimated 10 min to complete. Online surveys can only be submitted after all the questions are answered, so there are no missing values in the data collected.

The survey was publicised through the social media accounts (Twitter, Instagram) of MaCoBioS. 105 stakeholder groups representing conservation, tourism/recreation and fishing/seafood interests in the countries and territories MaCoBioS works (UK, Norway, Ireland, France, Italy, Spain, Bonaire, Martinique and Barbados) were contacted directly by email and social media to inform them of the survey and ask them to share with their members, aiming for a purposive snowball style recruitment (i.e. using participant referrals to build the sample) [9,10]. While snowball sampling means the respondent sample cannot be inferred to be representative of a larger population, it can be effective for accessing harder to reach groups that may be missed with random sampling [11]. Table 2 provides a list of the stakeholder groups contacted during survey dissemination by country/territory and sector (conservation, tourism/conservation, fishing/seafood). Organisations were identified based on the expertise of in-country partners. In ad-

dition, members of the MaCoBioS consortium advertised the survey through their own networks and by including the survey URL in their email signatures.

Estimating the size of the target population for this survey is difficult due to the challenges of: (1) knowing how many people fall within these stakeholder groups in each country, and therefore the representative sample size that would be needed; (2) knowing organisation membership sizes; (3) knowing which organisations chose to share our survey with their members; and (4) using an online questionnaire open to all which makes it impossible to control sample sizes. Recognising these challenges, results, interpretations and conclusions should be presented based on the respondent sample and not generalised to entire stakeholder groups in each country.

At the end of the survey period, 717 responses were received. Eight responses were removed following data screening for inconsistent responses (e.g., discord between responses about the existence of climate change and impact of climate change,  $n = 7$ ) and for target stakeholder representation (e.g. reported as not interacting / interested in the coast / ocean,  $n = 1$ ). The final sample size was therefore 709 responses. [Table 3](#) presents an overview of respondent characteristics.

## Ethics Statement

This study was approved by the Research Ethics Committee of the College of Life and Environmental Sciences at the University of Exeter on 2nd November 2021 (Ref. No.: 491857). Informed consent was obtained from all respondents prior to their completion of the survey. Respondents were presented with an initial information screen which included a link to the participant information form which provided more information about the research project and survey. This was followed by an initial question which asked the respondent to confirm they had read and understood the participant information form and that they voluntarily agreed to participate in the study. Only respondents who agreed to this were permitted to complete the survey.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data Availability

[Marine and coastal ecosystems and climate change: dataset from a public awareness survey \(Original data\)](#) (Mendeley Data).

## CRediT Author Statement

**Catarina Fonseca:** Conceptualization, Methodology, Data curation, Visualization, Writing – original draft, Writing – review & editing, Supervision; **Louisa E. Wood:** Methodology, Data curation, Visualization, Writing – original draft, Writing – review & editing; **Mialy Andriamahefazafy:** Methodology, Writing – review & editing; **Gema Casal:** Methodology, Writing – review & editing; **Tomas Chaigneau:** Methodology, Writing – review & editing; **Cindy C. Cornet:** Methodology, Writing – review & editing; **A. Karima Degia:** Methodology, Writing – review & editing; **Pierre Failler:** Methodology, Writing – review & editing; **Gianluca Ferraro:** Methodology, Writing – review & editing; **Elisa Furlan:** Methodology, Writing – review & editing; **Julie Hawkins:** Methodology, Writing – review & editing; **Silvia de Juan:** Methodology, Writing – review & editing; **Torsten Krause:** Methodology, Writing – review & editing; **Tim McCarthy:** Methodology,



Writing – review & editing; **Géraldine Pérez**: Methodology, Writing – review & editing; **Callum Roberts**: Methodology, Writing – review & editing; **Ewan Trégarot**: Methodology, Writing – review & editing; **Bethan C. O’Leary**: Conceptualization, Methodology, Data curation, Visualization, Writing – original draft, Writing – review & editing, Supervision.

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