



## Citizens, social media and science: Citizen Science as a tool for public engagement in cetacean research

### *Cidadãos, mídia social e ciência: a Ciência Cidadã como ferramenta de engajamento público na pesquisa com cetáceos*

Liliane LODI<sup>1\*</sup>, Guilherme MARICATO<sup>1,2</sup>, Pâmela MATHIAS<sup>1</sup>

<sup>1</sup> Instituto Mar Adentro, Rio de Janeiro, RJ, Brasil.

<sup>2</sup> Universidade Estadual do Rio de Janeiro (UERJ), Rio de Janeiro, RJ, Brasil.

\* E-mail of contact: lilianelodi@gmail.com

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**ABSTRACT:** Citizen Science brings together the interest of researchers in obtaining data and the public's availability to produce it, favoring a reciprocal relationship between academia and society. This partnership between experts and the lay public allows for the increase of data that is incorporated in the production of knowledge. This study highlights the effectiveness of collaborative research, through a network of volunteers who play an important role in obtaining data on the occurrence of cetaceans in coastal waters of the state of Rio de Janeiro, southeastern Brazil. The information was collected from data compiled through a group of the social network, Facebook, called "Where are the Whales and Dolphins?" between the years 2015 and 2019. A good analysis for Citizen Science programs should include a survey of demographic indicators on the characteristics of their volunteers. A greater adhesion of the group members was identified in January, a period of school recess in Brazil and in the summer, when there is increased coastal recreation and leisure activities. Membership in the social media group is mainly Brazilians (96.4%), natives of the state of Rio de Janeiro (49.3%), most often females (65.0%) with a professional profile related to Environmental Sciences (34.9%). From the information posted in the group, 315 sightings of eight species of cetaceans were recorded. The popularity of these animals, as a charismatic marine fauna, seems to facilitate the availability of the public to contribute to the acquisition and improvement of species' knowledge. The volunteers' information can either complement the records made by researchers or corroborate results already obtained.

**Keywords:** Citizen Science; virtual social network; participatory collaboration; cetaceans; Rio de Janeiro.

## RESUMO:

A Ciência Cidadã reúne o interesse dos pesquisadores em obter dados e a disponibilidade do público em produzi-los, favorecendo uma relação recíproca entre academia e sociedade. Essa parceria entre especialistas e público leigo permite o incremento de dados que são incorporados na produção de conhecimento. Este estudo destaca a eficácia da pesquisa colaborativa, por meio de uma rede de voluntários que tem um papel importante na obtenção de dados sobre a ocorrência de cetáceos em águas costeiras do estado do Rio de Janeiro, sudeste do Brasil. As informações foram coletadas a partir de dados inseridos em um grupo da rede social, Facebook, denominado por “Onde estão as Baleias e os Golfinhos?” entre os anos de 2015 e 2019. Um bom diagnóstico para programas de Ciência Cidadã deve contemplar o levantamento de indicadores demográficos sobre as características de seus voluntários. Foi identificada uma maior adesão dos membros do grupo em janeiro, durante o recesso estudantil no Brasil, e no verão, quando a costa é mais frequentada para atividades de recreação e lazer. Os seguidores do grupo são principalmente brasileiros (96,4%), naturais do estado do Rio de Janeiro (49,3%), com maior frequência do gênero feminino (65,0%) e com perfil profissional relacionado às Ciências Ambientais (34,9%). Das informações postadas no grupo, foram registradas 315 avistagens de oito espécies de cetáceos. A popularidade desses animais, como fauna marinha carismática, parece facilitar a disponibilidade das pessoas em contribuir para a aquisição e aperfeiçoamento do conhecimento das espécies. As informações dos voluntários tanto podem complementar os registros feitos por pesquisadores quanto corroborar resultados já obtidos.

*Palavras-chave:* Ciência Cidadã; rede social virtual; colaboração participativa; cetáceos; Rio de Janeiro.

## 1. Introduction

Citizen Science is the intentional, non-professional involvement of individuals in the scientific process (Silvertown, 2009; Pocock *et al.*, 2015) that has become a global movement with growing legitimacy (Hecker *et al.*, 2018). This movement has the potential to efficiently collect extensive datasets, in addition to enabling low-cost environmental monitoring when compared to the traditional research studies carried out by professional scientists (Pocock *et al.*, 2015; Parsons *et al.*, 2018; Robbins *et al.*, 2020).

Shirk *et al.* (2012) divide Citizen Science projects into five models based on the type of public participation in scientific research, namely: contractual (the communities request some research study to the scientists), collegiate (non-scientists produce scientific knowledge independently), co-created (volunteers and researchers participate in all stages of the research studies that will direct

the project), collaborative (projects designed by scientists in which the participants collect data, but can also assist in other stages) and contributory (the volunteers mainly participate in data collection).

Although marine and coastal Citizen Science programs are uncommon when compared to terrestrial initiatives, they provide a significant cost-benefit ratio by collecting extensive datasets covering vast spatiotemporal scales (Kaschner *et al.*, 2006; Thiel *et al.*, 2014; Alessi *et al.*, 2019). Consequently, it becomes suitable to involve a large number of volunteers to cover a wide sea area at different moments. Accuracy of the quality of the data collected by the volunteers must satisfy a well-defined criterion to be correctly interpreted so that its subsequent use is free from misinterpretations (for example, Fowler *et al.*, 2013). Data evaluation is generally conducted by professional scientists (Thiel *et al.*, 2014).

The number of Citizen Science publications per country is positively associated with

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a high Human Development Index (HDI) (Requier *et al.*, 2020). There is a tendency for greater abundance of projects in marine and conservation research in developed countries when compared to those with developing economies, such as Brazil and South Africa, which often lack resources for the development of Citizen Science programs (Earp & Liconti, 2018; Requier *et al.*, 2020).

Among the most popular taxa those with charismatic appeal stand out, including sea mammals, seabirds, sharks and rays (Earp & Liconti, 2018). Several low-cost tools have been incorporated as the basis for the focus of the Citizen Science projects with sea mammals through platforms for observation opportunities at sea (Tonachella *et al.*, 2012; Bruce *et al.*, 2014; Alesi *et al.*, 2019; Robbins *et al.*, 2020) and on the ground (Bristow *et al.*, 2001; Camphuysen 2011; Tonachella *et al.*, 2012; Embling *et al.*, 2015; Alesi *et al.*, 2019).

Considering the territorial extension of the coastal and oceanic environments, in addition to the diversity of habitats and species, intensive research activities over time and space are required to understand the environmental issues. Consequently, recognition of Citizen Science must be considered as a powerful tool to generate data and disseminate knowledge (Thiel *et al.*, 2014), as well as for monitoring (Lee *et al.*, 2006) and conservation (Greenwood, 2007) purposes.

The Citizen Science project described in this study involves a Facebook social network group called “*Onde estão as Baleias e os Golfinhos?*” (“Where are the whales and dolphins?”) (<https://www.facebook.com/groups/baleiasgolfinhos.rj>) created in October 2013 by one of the authors (the

lead author). The objectives of the group are as follows:

- 1) To mobilize and involve society in participatory scientific research;
- 2) To recruit volunteers to communicate records of whale and dolphin sightings in coastal waters in the state of Rio de Janeiro, southeastern Brazil, which will be used in scientific research;
- 3) To create a database with records of cetacean sightings obtained through the group;
- 4) To prepare the participatory mapping of cetacean biodiversity, distribution and seasonality in coastal waters in the state of Rio de Janeiro; and
- 5) To pass on general information about the coastal and sea environments in knowledge expansion. Compilation of the data collected by Citizen Scientists will help formulate public policies for the conservation of sea areas in the state of Rio de Janeiro, with an emphasis on cetaceans.

Due to the Citizen Science practice to encourage participation of the non-specialist population in research and conservation, in addition to the advantages of this type of science described above, this paper aimed at understanding the profile of the social network group members for feedback and improvement of the process, in addition to evaluating the volunteers' contribution in the knowledge about the occurrence of cetaceans in coastal waters of the state of Rio de Janeiro.

## 2. Methods

The study area, the platform used, the recruitment and survey of demographic indicators of the

volunteers' characteristics and the records of cetacean sightings are described below, whose type of public contribution to scientific research falls under the modality of a contributory project according to Shirk *et al.* (2012).

## 2.1. Study area

The state of Rio de Janeiro, located in the Brazilian Southeast region, has an estimated population of approximately 18 million inhabitants, with more than 60% living in the coastal municipalities (IBGE, 2021). The state's coastline is nearly 635 kilometers long, with diversity of coastline ecosystems. Considering the coast morphology and the coastline influence areas of the main hydrographic basins, the state's littoral region is divided into two macro-compartments: The Campos Basin, on the East coast, where the most important river mouths are concentrated; and the coastal ridges on the South coast, with presence of extensive beach arches associated with coastal ridges, bays, lakes and lagoons (Muehe & Valentine, 1988).

## 2.2. Platform

The Facebook social network was chosen as platform for inclusion of the data from Scientific Citizens for being a successful social media and virtual social network, with free access and significant adherence. As strategies for retention of the participants, the group presents quarterly posts to disclose the data obtained by the volunteers to the community and encourages its members through

publications about the Citizen Scientists of the Month, to value personal satisfaction and public recognition, in addition to promoting curiosity about marine ecosystems and their conservation. The social network group is registered in the Information System on Brazilian Biodiversity (*Sistema de Informações sobre a Biodiversidade Brasileira*, SiBBr - Ministry of Science, Technology, Innovation and Communications; Ordinance No. 6,223 of November 29<sup>th</sup>, 2018), in the Citizen Science national hub<sup>1</sup>.

The data were collected between January 1<sup>st</sup>, 2015, and December 31<sup>st</sup>, 2019, from a Facebook social network group called “*Onde estão as Baleias e os Golfinhos?*”.

## 2.3. Recruitment of the participants

Recreational users of the sea environment are often attracted by opportunities where they can expand their knowledge base and participate in research studies (Campbell & Smith, 2006; Cohn, 2008). The group was widely publicized on Facebook in social and professional profiles directly or indirectly linked to sea life and its conservation. People interested in conservation are generally connected with other like-minded individuals and/or online groups and, consequently, a positive information sharing cycle from the “*Onde estão as Baleias e os Golfinhos?*” group was generated, benefiting the recruitment scope regarding participants. Over time, the participants themselves started to publicize the group and to request inclusion of other members.

No skill or experience criteria were applied to select participants in the participatory approach. According to Greenwood (2007), amateurs may have

<sup>1</sup>Citizen Science national hub: <https://www.sibbr.gov.br/cienciadada/projetos.html>

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less experience than professionals but, as they are generally local participants, it is assumed that they are familiar with the study area, compensating for differences in experience and qualification.

Although the group is open to the participation of all interested parties, the desired target population was the residents of the state of Rio de Janeiro, as one of the main objectives of the group is to compile the records of whale and dolphin sightings on the state's coast.

#### *2.4. Sociodemographic data of the participants*

Personal data identifying the users were compiled to better understand the group's users, which is the population. The data analyzed were related to the member's join date (month and year), nationality, origin, region of residence, gender, age, profession and profile (both personal and professional). The objective of this analysis was to identify the profile of the group members for better performance of its strategy and content. In order to better understand the incorporation of new members per month, the chi-square test was performed to verify if there were periods of higher adherence.

Age was subdivided into four categories, according to the generational profiles defined in Smola & Sutton (2002):

- 1) Baby Boomers (born until 1964);
- 2) X Generation (born between 1965 and 1978);
- 3) Y Generation (born between 1979 and 1994); and
- 4) Z Generation (born from 1995 onwards).

The group members' occupations were categorized into 5 classes:

- 1) Maritime: occupations related to the sea, nautical sports and tourism (for example: sailor, diver and fisherman);
- 2) Graduates from courses in the field of Environmental Sciences (for example: biologist, oceanographer and geologist);
- 3) Workers in formal and informal education (educators);
- 4) Students (fundamental education: elementary and secondary education; and higher education: undergraduate and graduate studies); and
- 5) Others: diverse areas (for example: writer, entrepreneur and physician).

#### *2.5. Cetacean sightings reported*

Non-structured cetacean records were compiled. These records are characterized as those in which there is no formal structure imposed on the collection process.

An important challenge that must be taken into account by Citizen Science projects is to ensure that the data collected by the volunteers is of sufficient quality to be used to address scientific issues (Silvertown, 2009; Foody *et al.*, 2013). The data on cetacean sightings were posted in the Facebook group through photographs or videos. To ensure reliability of the records, only the images which clearly allowed identifying the taxon's diagnostic features (external morphology and color) were selected. Therefore, all sighting records were filtered and validated by the group administrators to

verify if the information met the criterion defined and could be correctly interpreted by analyzing the images so that their subsequent use would be free from misinterpretations.

The data corresponding to each record included the sighting geographical coordinates or location, approximate group size and behavior. When the coordinates were not available, one of the authors to obtain more precise information about the location contacted the informant/volunteer.

### 3. Results

#### 3.1. Profile of the members

The Facebook group had 4,654 users between January 2015 and December 2019. The greatest member incorporation rate per year ( $n = 1,400$ , 30.1%) was observed in 2016 (Figure 1A). The group presented more adherence in January ( $n = 650$ , 14.0%), followed by July ( $n = 543$ , 11.7%) and June ( $n = 543$ , 11.6%) (Figure 1B).

Most of the members ( $n = 4,454$ , 93.6%) were Brazilians and came from the Southeast region ( $n = 2,557$ , 78.4%) (Figure 2A). In relation to their origin, there was a higher number of members ( $n = 1,609$ , 49.3%) living in the state of Rio de Janeiro (Figure 2B).

Most of the members ( $n = 2,919$ , 65%) were female (Figure 3A). In relation to their generations, there is predominance of the Y Generation among the members (Figure 3B).

Regarding their occupations, predominance of members in the Environmental Sciences areas ( $n = 599$ , 34.9%) (Figure 4) and with a personal profile ( $n = 4,627$ , 99.7%) was observed.

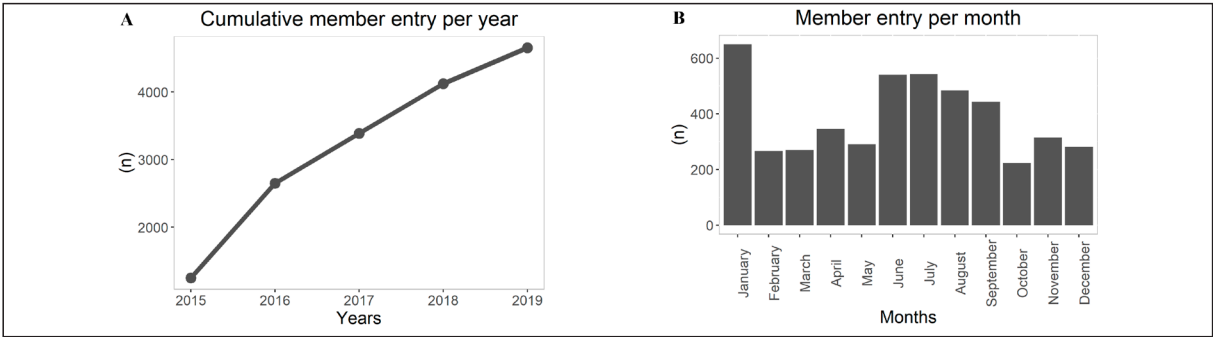


FIGURE 1 - Cumulative curve of annual growth (A) and monthly member incorporation (B) per year in the “Onde estão as Baleias e Golfinhos?” Facebook group, between 2015 and 2019.

SOURCE: Prepared by the authors based on the research data.

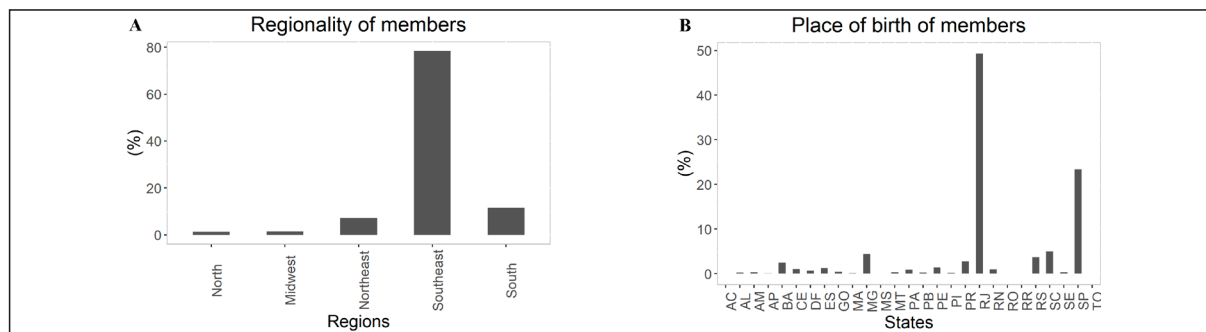


FIGURE 2 - Brazilian regionality (A) and origin (B) of the “*Onde estão as Baleias e Golfinhos?*” Facebook group members, between 2015 and 2019. (AC = Acre, AL = Alagoas, AM = Amazonas, AP = Amapá, BA = Bahia, CE = Ceará, DF = Distrito Federal, ES = Espírito Santo, GO = Goiás, MA = Maranhão, MG = Minas Gerais, MS = Mato Grosso do Sul, MT = Mato Grosso, PA = Pará, PB = Paraíba, PE = Pernambuco, PI = Piauí, PR = Paraná, RJ = Rio de Janeiro, RN = Rio Grande do Norte, RO = Rondônia, RR = Roraima, RS = Rio Grande do Sul, SC = Santa Catarina, SE = Sergipe, SP = São Paulo, TO = Tocantins)

SOURCE: Prepared by the authors based on the research data.

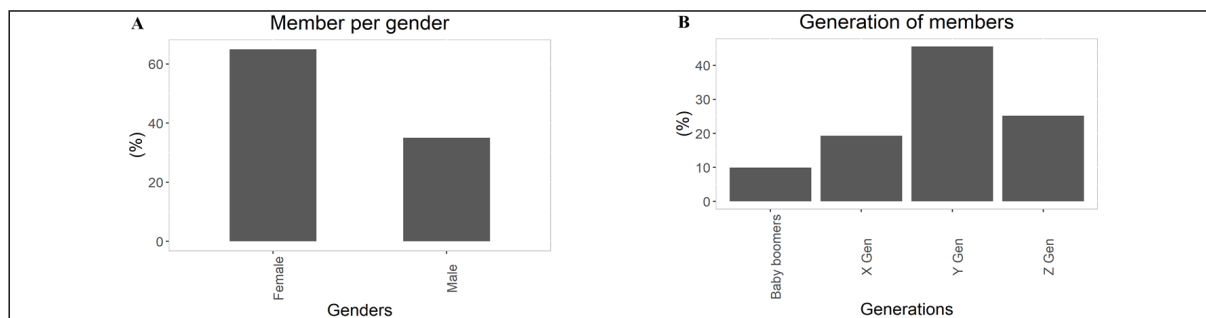


FIGURE 3 - Gender (A) and generation (B) of the “*Onde estão as Baleias e Golfinhos?*” Facebook group members, between 2015 and 2019.

SOURCE: Prepared by the authors based on the research data.

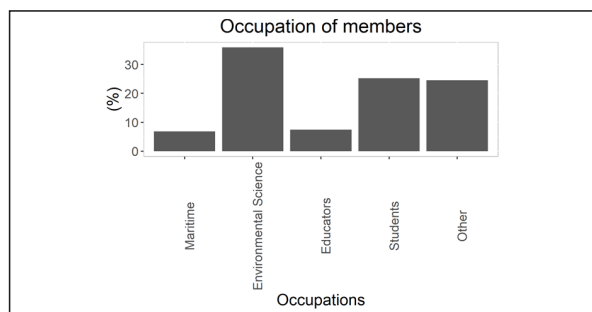


FIGURE 4 - Professions of the “*Onde estão as Baleias e Golfinhos?*” Facebook group members, between 2015 and 2019.

SOURCE: Prepared by the authors based on the research data.

### 3.2 Cetacean sightings

The study area that included diverse information from the Citizen Scientists corresponded to the Rio de Janeiro coastline between Trindade, municipality of Paraty (23°21'4.74" - 44°43'1.42"), and the Sant'Ana Islands, municipality of Macaé (22°24'12.78" - 41°42'45.22") (Figure 5).

A total of 315 sighting records were made by the group's volunteers between 2015 and 2019.



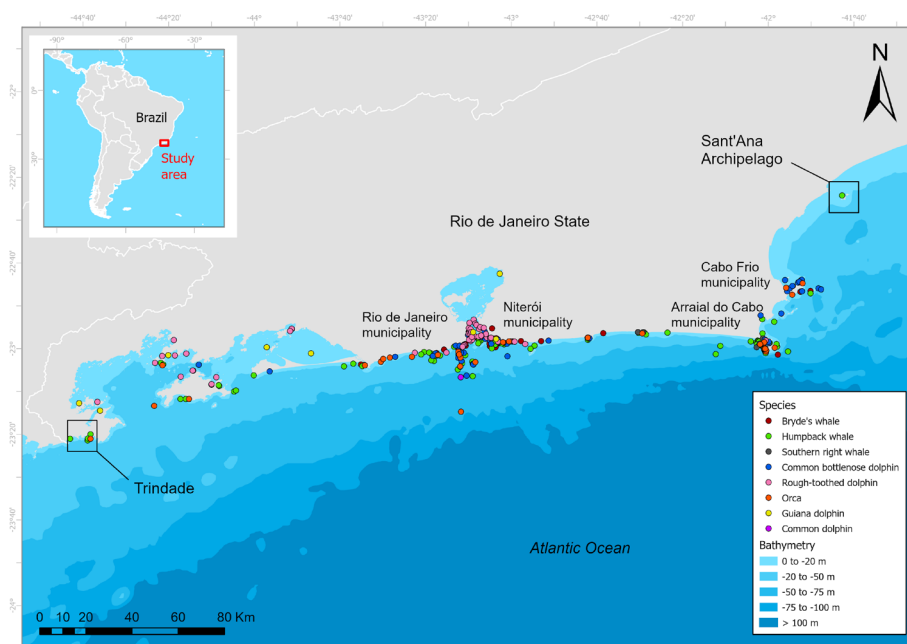


FIGURE 5 - Limits of the diverse information collected by Citizen Scientists between 2015 and 2019. West limit: Trindade, municipality of Paraty. East limit: Sant'Ana Islands, municipality of Macaé. Colored points: Cetacean records made by Citizen Scientists.

SOURCE: Prepared by the authors based on the research data.

Approximately 95% of the records were obtained from volunteers who were on boats at sea or who practiced nautical recreational activities. Among the records, it was not possible to identify the species in 10% ( $n = 35$ ) due to the quality of the images. The reliable records allowed identifying eight different cetacean species along the coast of the state of Rio de Janeiro, namely: humpback whale, *Megaptera novaeangliae* (33.3%), common bottlenose dolphin, *Tursiops truncatus* (19.4%), rough-toothed dolphin, *Steno bredanensis* (17.5%), Bryde's whale, *Balaenoptera brydei* (15.9%), orca, *Orcinus orca* (9.8%), Guiana dolphin, *Sotalia guianensis* (2.5%), southern right whale, *Eubalaena australis* (1.3%) and common dolphin, *Delphinus delphis* (0.3%). The highest

number of records came from the municipalities of Rio de Janeiro, Niterói, Arraial do Cabo and Búzios (Figure 5). The number of records by species and the occurrence seasonality frequency are presented in Table 1.



TABLE 1 - Records and frequency of cetacean species by season of the year between 2015 and 2019 in the state of Rio de Janeiro based on data collected in the Facebook social network group called “*Onde estão as Baleias e os Golfinhos?*”.

Species	Nº of Records	% Season			
		Summer	Autumn	Winter	Spring
Humpback whale	105	---	1.8	88.6	9.4
Bryde's whale	50	80	8	6	6
Southern right whale	04	---	---	25	75
Common bottlenose dolphin	61	42.6	26.2	21.3	9.8
Rough-toothed dolphin	55	9	38.1	40	12.7
Orca	31	35.4	9.6	9.6	45.1
Guiana dolphin	08	50	37.5	12.5	---
Common dolphin	01	100	---	---	---
<b>Total</b>	<b>315</b>				

SOURCE: Prepared by the authors based on the research data.

## 4. Discussion

### 4.1. Profile of the members

Describing the characteristics of non-specialists is relevant to understand the demographic profile of Citizen Scientists, which, in general, is little explored in Citizen Science articles (Thiel *et al.*, 2014; Earp & Liconti, 2018).

The success of the Facebook group was increased with the extension in time of the Citizen Science project, a powerful tool for the generation and dissemination of scientific knowledge at a reduced cost when compared to traditional research studies.

The highest rate of member incorporation to the group was in summer (January), time corresponding to school holidays in Brazil. In this season, it is also common that the coastal area is sought for leisure by bathers, as well as for nautical tourism and sporting activities. Another peak was recorded in winter (June and July), when the humpback whale, a species that obtained the highest number

of sightings and that is in clear population recovery (Bortolotto *et al.*, 2017), migrates to its reproduction areas.

Regarding the demographic distribution, the highest frequencies of members corresponded to Brazilian nationals, from the Southeast region and nationals of Rio de Janeiro and, therefore, not coming from a wide variety of demographic backgrounds. There was greater regional interest in the participatory approach by local participants. Considering the objectives proposed by the group, this result indicated that the target population was successfully reached. The geomorphological formation of the city of Rio de Janeiro, characterized by the combination of sea, mountains and forest, provides close contact with nature to its residents. In 2012 the city became the first in the world to receive the UNESCO title of World Heritage Site as a Cultural Landscape as it constitutes a unique example of integration of the city with the landscape. Students from urban areas in the Brazilian North region are more interested in studying biodiversity elements when compared to

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those from urban and rural areas in the South and Southeast regions. Students who live in the Amazon region have a different contact with nature, as they are immersed in a sociocultural atmosphere rich in indigenous people and local knowledge related to biodiversity (Franzolin *et al.*, 2020).

Regarding the greater participation of females as group volunteers, a number of research studies indicate that women are more involved in relation to preservation of the environment and highlight the women's role in natural resource management, as relevant and active protagonists of local, regional and global actions (Castro & Abramovay, 2005). The attention given to nature or to knowledge about the species is important to increase interest and understanding of biodiversity, environmental issues and sustainability (Castro *et al.*, 2016).

People belonging to the Y and Z Generations have grown up in a digital and globalized world and are relatively more familiar with technology and possibly with a greater level of commitment to actions aimed at conservation. Although Generation Z has presented a lower frequency than Generation Y, it is necessary to consider that Facebook only accepts members over 18 years old, that is, only those born until 2002 were counted in this study.

There was participation of a large number of volunteers with varied educational or professional experiences. Individuals linked to the Environmental Sciences area represented the highest frequency in the the group members' classes of professions, followed by Students. Therefore, it is necessary to invest greater efforts to encourage and motivate more effective participation of other knowledge areas so that other people acquire confidence and the

sensation that citizens believe they can contribute to a real change acting individually and/or collectively.

With reference to the members' profile, the interest was precisely to reach more personal profiles in order to engage people by providing a different approach on the importance of obtaining local biodiversity data of cetaceans for the general population and not for professionals.

The need for a joint study of science, society and technology is increasingly evident. Although they have always been linked throughout history, in contemporary times, the intrinsic relationship between these three fields is becoming clearer (Barcellos, 2016).

Online social networks are important in favoring democratization of the information in the digital society. We can all be emitters and receivers in them, simultaneously. The volunteers' motivation included the knowledge acquired and a positive sense of contributing to conservation, in addition to increasing personal and social awareness. A better understanding of the human or social dimensions of the environmental issues can be gained by recognizing citizens as research partners to promote and rally support for the planning and implementation of conservation policies (Bennett *et al.*, 2017).

#### 4.2. Cetacean sightings

The use of Citizen Science to collect data on cetacean sightings is a pioneering and promising initiative in Brazil, which can serve as an example for other research institutions devoted to this group of animals. The use of a digital social media platform with the contribution of people with different characteristics and the compilation of a database

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created through this platform offer possibilities for actions aimed at cetacean conservation. Citizen Science projects are an advantageous method to conduct research studies in the marine environment, especially regarding highly nomad species such as whales and dolphins. Reviews about the use of Citizen Science in marine research studies report that one of the most popular projects includes opportunistic sighting records (Thiel *et al.*, 2014; Earp & Liconti, 2018), which follows the purpose adopted by the group.

In this study, the data made available by the Citizen Scientists allowed increasing the amount of information about cetaceans. Recruitment of volunteers allowed for a more complete analysis and a representative sample of the occurrence and seasonality of these animals in the Rio de Janeiro coastline waters. The results obtained are important to cover areas not monitored by researchers; in addition to obtaining preliminary results and filling knowledge gaps about the occurrence and distribution of species.

The professional contribution adds value to the data from biological records made by volunteers through their use in additional research studies and monitoring initiatives (Pocock *et al.*, 2015). Voluntary, timely and complementary observations with other information sources, such as records made by researchers, increases the representativeness of the data from the observers' network (Thiel *et al.*, 2014; Lodi & Tardin, 2018).

The sightings by Citizen Scientists were concentrated in more accessible coastline habitats, up to 75 meters deep. Therefore, this result must be interpreted with caution, as the cetacean distribution maps often reflect effort concentration instead of occurrence concentration (Kenney & Winn, 1986;

Kaschner *et al.*, 2006). Nevertheless, these data ratify the cetacean distribution and seasonality results in coastline waters reported in the literature (Lodi & Tardin, 2018; Lodi & Maricato, 2020; Lodi *et al.*, 2020). Two cetacean species reported by Citizen Scientists, such as the southern right whale and the Guiana dolphin, are included in the Official National List of Endangered Fauna Species (Ministry of the Environment, Ordinance No. 444 of December 17<sup>th</sup>, 2014), reinforcing the potential of the volunteer team's contribution.

At the global level, there has been growing recognition of the importance of partnerships as a tool for monitoring biodiversity (especially in the context of budget constraints and lack of institutional resources for the detailed study of highly nomad and widely distributed species, for example). In the marine domain, data accessibility is limited to researchers, whether due to logistical or financial constraints, especially considering the budgetary reductions in science and education that have been announced in Brazil in the last two years.

The participation of Citizen Scientists offers benefits both for research, as it improves the studies' spatiotemporal coverage, and for the general population, which discloses the results obtained that they have contributed, leading to better acceptance of scientific knowledge and of the conservation issues. Availability of these data allowed obtaining diverse information on the priority cetacean species in coastal habitats in the state of Rio de Janeiro, enabling understanding for the elaboration of a management program and of governmental policies.

Citizen Science is an inter- and transdisciplinary scientific research approach that has been gaining visibility in Brazil, a strategic process in the coalition between science and society. Therefore, it

becomes important to discuss Open Science public policies in collaborative practices for qualification in different spaces, especially in public schools and universities.

## 5. Final considerations

The analysis of the data identified by the users of the “*Onde estão as Baleias e os Golfinhos?*” Facebook group users allowed compiling diverse significant information for better understanding the group's users to formulate future member retention strategies. Therefore, it is suggested that the projects include the demographic indicators of their volunteers, as public engagement is a fundamental aspect of Citizen Science.

The system used aims at providing an environment where people can share their photographs, information and knowledge about cetaceans in Rio de Janeiro. The images and data associated to the cetacean sightings offer free access to those interested, as they are recorded in the Facebook group's timeline.

This paper involved society in participatory scientific research, increasing and corroborating knowledge about the distribution and seasonality of cetaceans in the Rio de Janeiro coastal waters, which will support the formulation of public policies for the conservation of sea areas. The use of Citizen Science to collect data on sightings of cetaceans, organisms with large living areas, is an auspicious initiative for Brazil, which can serve as a model for other research institutions.

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