



Connecting Science with the Public: Utilizing Different Avenues to Convey Science

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Abstract

Scientific articles and journals have traditionally been very text heavy, riddled with jargon, and its graphics very difficult to decipher. With our ocean degrading rapidly, it is imperative that we reach out to the public and communicate science that is both relatable and easy to understand.

The Central and Northern California Ocean Observing System (CeNCOOS) and MBARI have a history of excellence in research, data gathering, and analysis of the data. However, they are in need of ways to help communicate their work to the public and showcase why oceanographic research is important.

Effective communication requires that scientists understand what the public know, where the gaps in knowledge are, and what trends exist today in how the public learn in order to find a product that can be tailored to help them understand the value of what we do.

Introduction

Let me begin by stating that this is a not a typical research project. My objectives of this project was to

1. Determine what level of knowledge the public has regarding ocean acidification
2. Understand the trends of how the public consumes media
3. Design a product that can assist CeNCOOS and MBARI in getting their research and scientific information out to the public in an easy to digest and appealing manner

An informal survey was conducted to gain insight into what level of knowledge the public had pertaining to ocean acidification and the Southern Ocean. Combining the analysis of the survey data with research of the current trends of how the public learns provided insight into what the product will best suit the needs of the public.

The final product chosen to help educate the public on ocean acidification was a product by ESRI's ArcGIS online platform called the Story Map. This platform allows easy incorporation of videos, photos, webpages, and maps to tell a story of the user's choosing.

Below, I will discuss the method and results of how I looked into accomplishing each of the three parameters.

Methods

One: Determining public knowledge

The public is a powerful tool in determining whether a policy gets suggested, passed, and implemented. It was determined that almost 75% of relationships between public opinion and policy are statistically significant (Burstein 2003). While the public is free to form any opinion, society would benefit if their opinions were well informed, especially in the realm of scientific data on the ocean. Therefore, to determine what level of knowledge the public had in regards to ocean acidification and the Southern Ocean, I designed a very informal survey comprised of ten questions.

Two of the questions were demographic questions pertaining to the age of the respondents and where they reside. Our age range were split into five distinct ranges – 15-20, 21-34, 35-49, 50-

64, and 65+. I excluded those less than 15 years old because for this survey, I believed that they were too young to have sufficient knowledge in ocean sciences through school.

The next three questions pertained to how the respondent obtained their scientific information, whether they have social media platforms, and if they obtained news from them.

Five questions following social media asks the respondents about their knowledge of ocean acidification and the Southern Ocean. I designed the question so that they are as straight forward as possible as I did not want to confuse the user with wording and skewing the results. The three questions pertaining to OA are as follows:

1. Have you ever heard the term ocean acidification? Yes/No
2. If yes, how would you describe your level of knowledge on ocean acidification?
 - a. High/Medium/Low/Have only heard the term/Not sure
3. Do you think ocean acidification impacts your life? Yes/No

After the data was gathered, it was analyzed using Microsoft Excel and R statistical software to determine percentages and relevant statistics.

Two: Understanding the public

The average amount of time adults in the U.S. devote to consuming media is now 10 hours and 39 minutes each day. The information age that we are in today has been correlated to the reason why the average adult today has an attention span of approximately eight seconds in regards to web browsing, down from 12 seconds in 2000 (Weinreich 2016). That means that we have approximately eight seconds to hook a reader on the internet before we lose their attention span. Furthermore, once you have hooked the reader, you only have 4 minutes and 52 seconds until their attention span is exhausted. Therefore, it is imperative that one gets their message across in less than five minutes. To understand how this came to be, we need to understand the vastness of the information that is available on the internet.

DOMO is a company that studies internet trends, including analytics, social media usage, and demographics of users. Their compilation of data from major avenues of social media indicated that the amount of information created every minute of every day is staggering. For instance, in 2014, YouTube users uploaded 72 hours of video every minute of every day. This increased to 300 hours in 2015. The significant increases in the amount of video uploaded indicate that the public is more interested in video content. The internet trends, attention span, and rise in video

content also tells me that they will not respond as well to traditional methods of explaining science – which comprises of text and difficult to decipher graphics.

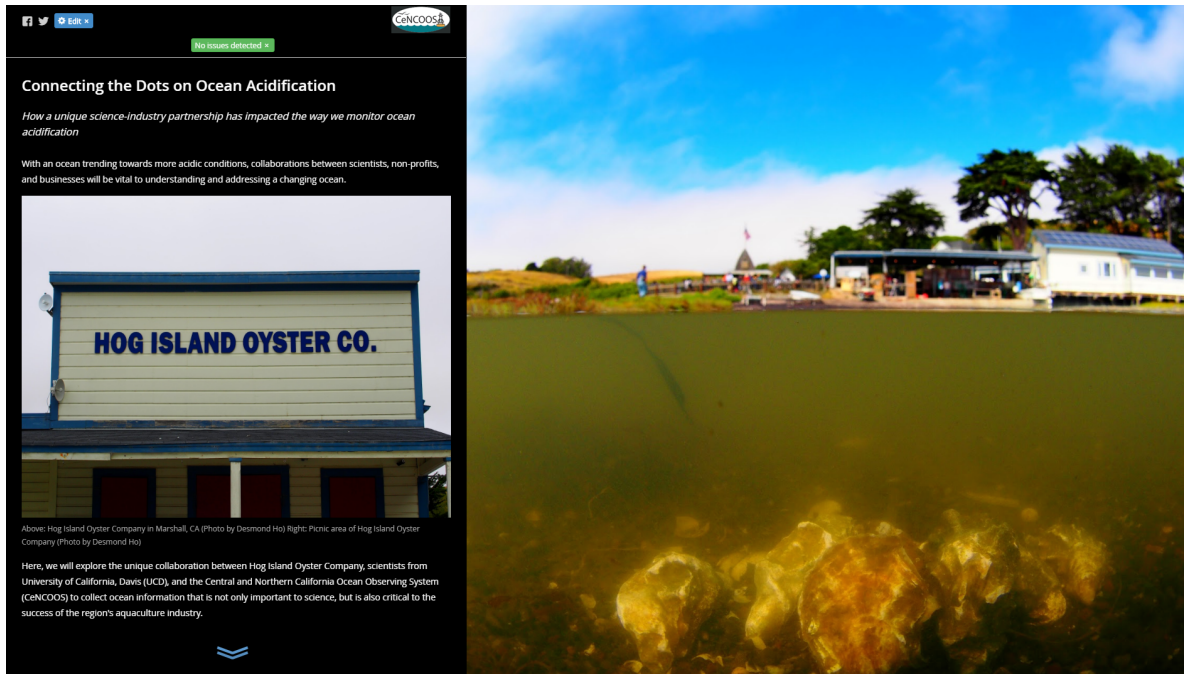
Three: Designing a product

Based on my findings above, it was imperative to design a product that can incorporate pictures, videos, and story-telling to help hook readers and more importantly, retain them. I chose to utilize ESRI's ArcGIS online story map tool to accomplish the goal.



Engage and Inspire Your Audience

The story map tool allows users to tell a story on one side of the panel and show a number of multimedia on the other. Within the story telling side, users are able to incorporate pictures and videos to help illustrate their point further.



It has a number of customizable options, including font size, color, type, panel size, and background colors to name a few.

Since CeNCOOS did not have the much multimedia content for me to use in the creation of this story map. I travelled with the director and program director (David Anderson & Aric Bickel respectively) to Bodega Marine Lab in Bodega Bay, CA and Hog Island Oyster Company in Marshall, CA to interview scientists, industry leaders, and get pictures and videos for my page. This was a unique opportunity because I got to utilize my skills in photography, videography, video editing, and interviewing.



The finished product was heavy on images, video interviews, and map content as opposed to text. As the user scrolls through the story, they are able to catch glimpses of information while focusing on the main story of what was happening to oyster growers. This product will speak to the users today that depend heavily on multimedia as opposed text to get their information. This story map will be embedded onto CeNCOOS's website under the news section as well as be placed onto social media (Facebook and Twitter).

Results

The demographic questions from our survey revealed that our age range had a positive skew with the highest level of respondents (29) from the 15-20 category. 21-34 year olds had 26 respondents, 35-49 had 20, 50-64 had 17, and 65+ had 11.

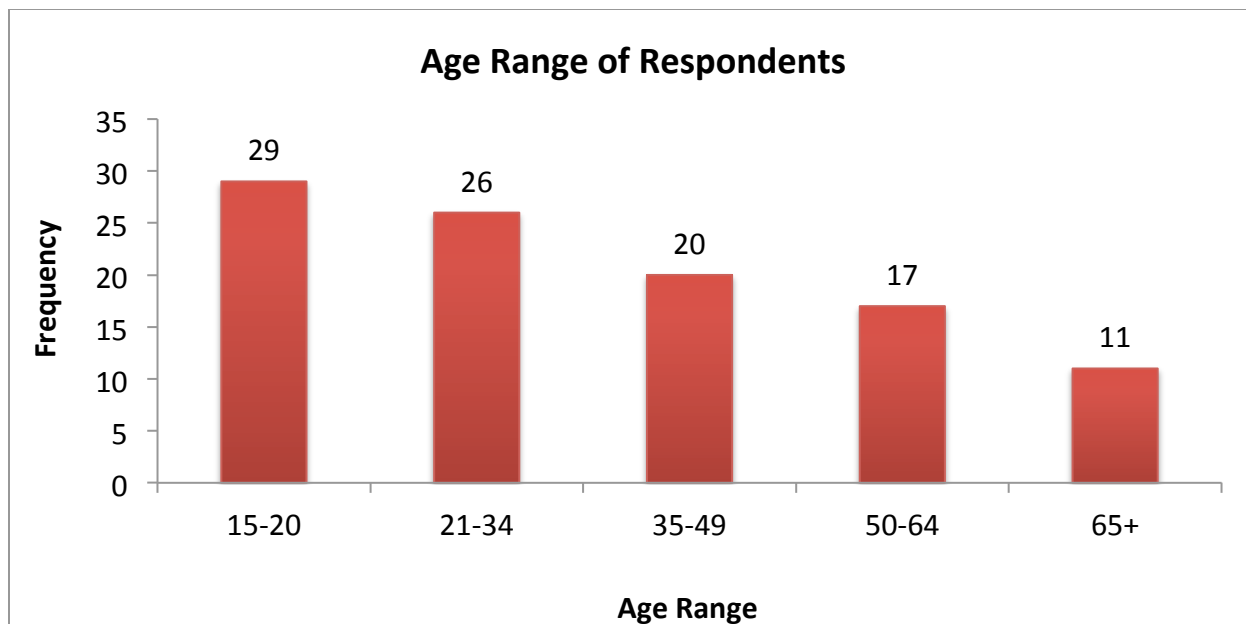


Figure 1: Age range of respondents from survey. (n=103)

53 out of 103 respondents were from California, our 2nd largest group was from United Kingdom (18), and our 3rd largest group was from Canada.

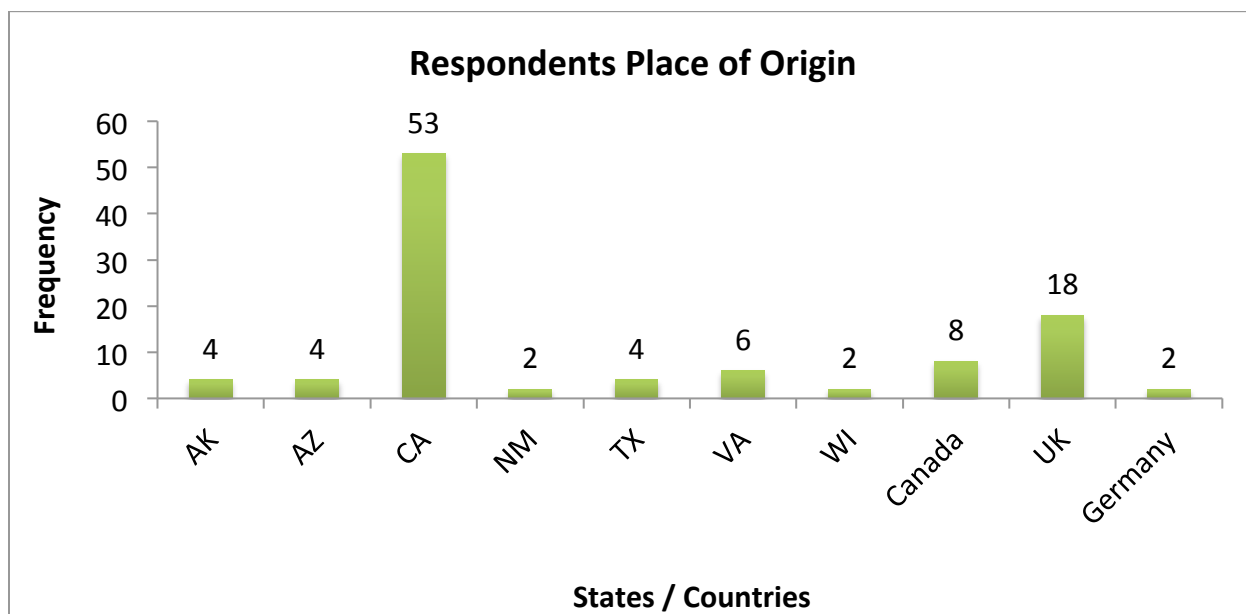


Figure 2: Place of origin from respondents. (n=103)

Responses to our question of have you ever heard the term ocean acidification yielded that 53% of our respondents have not heard the term and 47% has heard of it.

64% of our respondents believe that ocean acidification impacts them and 36% do not believe that it impacts them.

When we crossed respondents whom stated they have or have not heard of OA before with how many stated that OA impacts them or not, we get the following data.

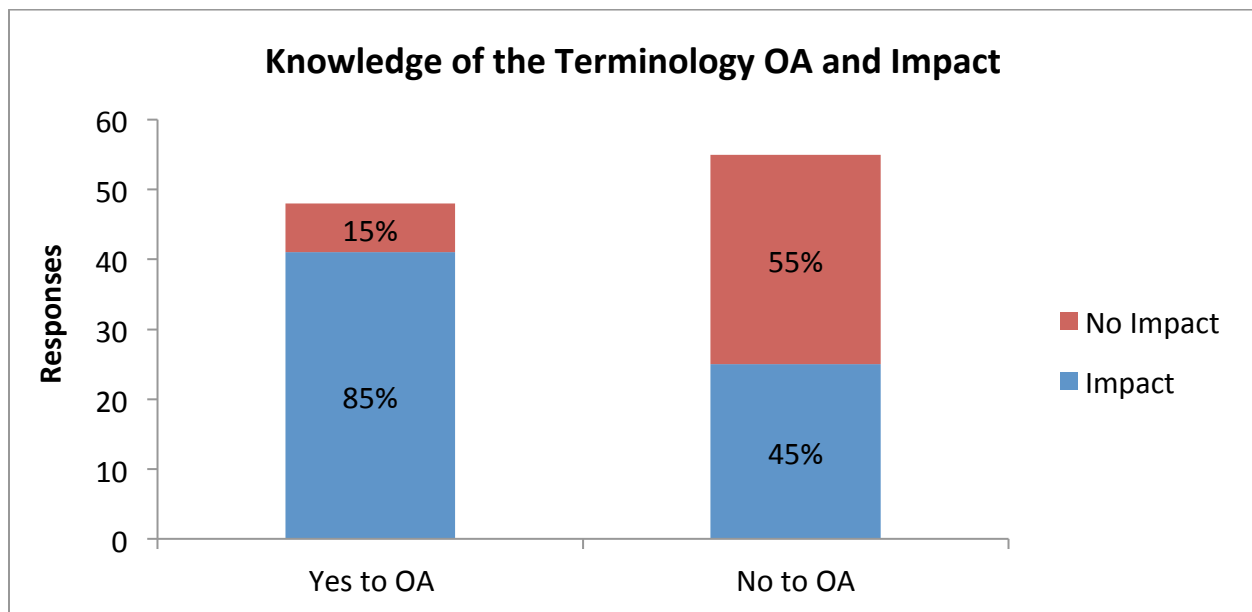


Figure 3: Left bar graph indicates percentage of those who responded YES to having heard of OA believing that OA impacts them in blue. Right bar graph indicates percentage of those who responded NO to having heard of OA believing that OA impacts them in blue.

The final figure looks at the self-reported perceived level of knowledge of ocean acidification ranging from No/None, Heard of, Low, Medium, and High level of knowledge.

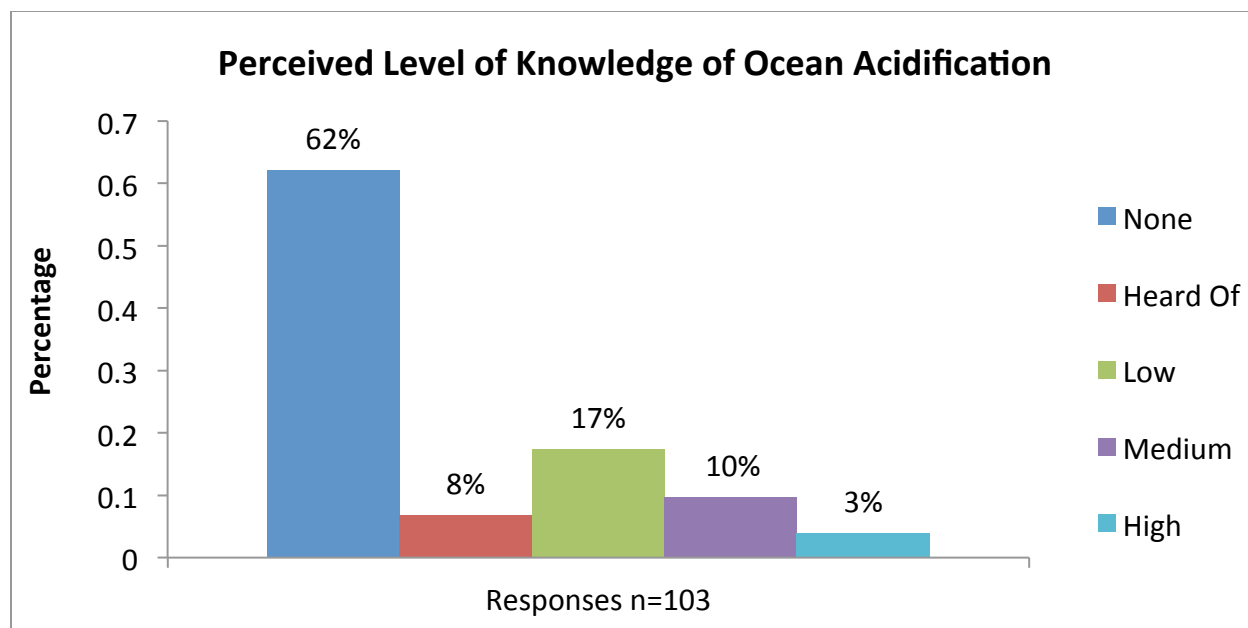


Figure 4: 103 respondents reported their self-perceived level of knowledge of ocean acidification ranging from no knowledge to high levels.

Discussion

Based on the results from our informal survey, it suggests that roughly half of the people have heard of ocean acidification and 78% of our respondents have little to no knowledge of what ocean acidification is. Of those people whom have not heard of OA before, only 45% of them believe that OA will impact their lives. As opposed to 85% of those whom have heard of OA believe that OA impacts their lives. Irrespective of the amount of knowledge people who have heard of OA know, it suggests that simply having heard the term OA will make a person more likely to believe that it has an impact on their lives. Of course, I will remind the reader that the survey used was very informal in nature and the sample size is small at 103. Therefore, it is imperative that formulate a survey that is properly designed and vetted to ensure as little bias as possible in order to get the information that we need.

Conclusion

Communication between science and the public is slowly coming into the spotlight at many research facilities. With a world and ocean that is rapidly changing today, it is imperative that we communicate science to the public in a manner that is captivating and at the same time, easy for

them to digest. While some scientists believe that we should not dumb down science for people to understand, I believe that if you have a PhD in your particular field, it should be easy for you to explain what you are doing in simple terms. Whether you agree with that statement or not, I believe that we can all agree that the more the public knows about our changing planet, the more likely they are to voice their opinions on what needs to be accomplished to reduce the degradation that is occurring.

Institutions such as MBARI can use online tools such as YouTube, social media, and story maps more often in their quest to complete this goal. While trends among the American public is largely out of our control, we can control how we present our information in an attempt to reach the widest audience possible.

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