



# Advancing Through the Pandemic From the Perspective of Marine Graduate Researchers: Challenges, Solutions, and Opportunities

Juan C. F. Pardo<sup>1,2\*</sup>, Debra Ramon<sup>3</sup>, Gabriel Stefanelli-Silva<sup>4</sup>, Isa Elegbede<sup>5</sup>, Luciana S. Lima<sup>6</sup> and Silas C. Principe<sup>7\*</sup>

<sup>1</sup> Center for Coastal Research (CCR), Department of Natural Sciences, University of Agder (UiA), Grimstad, Norway, <sup>2</sup> Norwegian Institute for Water Research (NIVA), Oslo, Norway, <sup>3</sup> Morris Kahn Marine Research Station, Department of Marine Biology, Leon H. Charney School of Marine Sciences, University of Haifa, Haifa, Israel, <sup>4</sup> Laboratório de Ecologia e Evolução de Mar Profundo (LAMP), Instituto Oceanográfico, Universidade de São Paulo (USP), São Paulo, Brazil, <sup>5</sup> Department of Environmental Planning, Brandenburg University of Technology Cottbus-Senftenberg (BTU), Cottbus, Germany, <sup>6</sup> Laboratório de Estudos do Oceano e da Atmosfera (LOA), Divisão de Sensoriamento Remoto (DSR), Instituto Nacional de Pesquisas Espaciais (INPE), São José dos Campos, Brazil, <sup>7</sup> Laboratório de Biologia Recifal (BIOREC), Instituto Oceanográfico, Universidade de São Paulo (USP), São Paulo, Brazil

## OPEN ACCESS

### Edited by:

David Koweek,  
Carnegie Institution for Science (CIS),  
United States

### Reviewed by:

Jessica N. Cross,  
Pacific Marine Environmental  
Laboratory (NOAA), United States  
Kennedy Wolfe,  
The University of Queensland,  
Australia  
Shawna Foo,  
Carnegie Institution for Science (CIS),  
United States

### \*Correspondence:

Juan C. F. Pardo  
pardojcf3@gmail.com  
Silas C. Principe  
silasprincipe@yahoo.com.br

### Specialty section:

This article was submitted to  
Ocean Solutions,  
a section of the journal  
Frontiers in Marine Science

**Received:** 07 May 2020

**Accepted:** 09 June 2020

**Published:** 24 June 2020

### Citation:

Pardo JCF, Ramon D, Stefanelli-Silva G, Elegbede I, Lima LS and Principe SC (2020) Advancing Through the Pandemic From the Perspective of Marine Graduate Researchers: Challenges, Solutions, and Opportunities. *Front. Mar. Sci.* 7:528. doi: 10.3389/fmars.2020.00528

The ongoing COVID-19 pandemic has brought about a new social and academic reality to researchers worldwide. The field of marine science, our own topic of interest, has also been impacted in multiple ways, from cancelation of laboratory and field activities to postponement of onboard research. As graduate researchers, we have a time-sensitive academic path, and our current situation may constrain our academic future. At the same time, the pandemic demands revised strategies to deal with the ongoing difficulties and tackle similar future situations. In this perspective, we have gathered information on the challenges, solutions and opportunities for graduate researchers in the field of marine science by (1) discussing the relevant short-, long-term challenges caused by the pandemic, (2) providing feasible immediate and near-future solutions, (3) compiling opportunities (courses, scientific events, academic positions), and (4) creating a shared social media account to make the available information on new opportunities more accessible. With this, we hope to add to the efforts to advance the academic career of marine graduates during this harsh period.

**Keywords:** coronavirus pandemic, early career researchers, career, opportunities, marine science and technology

## INTRODUCTION

Decision-makers, practitioners and economists have been discussing the actions needed to overcome our current situation with the ongoing COVID-19 pandemic. At the same time, researchers have also started to assess the consequences of this period on scientific development (Inouye et al., 2020). The recent editorial by Corlett et al. (2020) provides an overview of the current situation and expected impacts for biodiversity conservation, highlighting that it is premature to predict overall impacts in the field. Meanwhile, researchers are already facing the consequences of the pandemic and many early career researchers enrolled in their graduate programs are also

experiencing career-related issues as well as negative psychological impacts. As graduate researchers in marine science coming from multiple different fields from around the globe, we explore some of the ongoing problems and future challenges faced by ourselves and our peers due to the pandemic and propose immediate and long-term actions to tackle them. As there is the possibility of additional isolation periods (Kissler et al., 2020), finding and implementing solutions can help to move forward the academic career of graduate researchers. Although this pandemic has already impacted the lives of millions of people and proved to be a colossal challenge in many sectors of society, versatility and creativity can also bring forth opportunities for those working in marine science.

## IMMEDIATE DIFFICULTIES AND LONG-TERM CHALLENGES FOR MARINE GRADUATE RESEARCHERS

Marine graduate researchers, also included in the definition of early career ocean professionals, are directly impacted by COVID-19 in both the short- and long-term. The most immediate interruption has been the closing of university campuses worldwide, preventing students from physically attending classes, which have either been canceled or transferred to an online format. While online classes allow students to continue their studies, home-based learning has logistical requirements, including steady internet and a reliable computer, commodities not always available. Scientific work has been limited with either temporary closure of laboratories or limited work effort due to staff limitations and delays in equipment flow, with direct impacts on long-term laboratory experiments (Servick et al., 2020). Fieldwork has also been considerably restricted and sampling efforts, such as collecting time-sensitive data or use of valuable ship-time, have been postponed. This is especially problematic for marine science graduates, as fieldwork usually demands great logistic planning (e.g., equipment preparation, tide periods, and vessel availability), resulting in a considerable investment of time and financial costs. Moreover, cancellation or postponement of conferences represents a missed opportunity for graduate researchers to learn about advancements in their fields, discuss their research, and consolidate and expand their networks. As an example, the International Coral Reef Symposium, which is held every 4 years, had to be postponed, affecting the discussions about the research on this highly impacted ecosystem.

Graduate researchers in marine science are facing a reality where options that had been available before the pandemic cannot be taken into future consideration, as they are employed on short-term contracts with restricted deadlines. Supportive responses from universities and research foundations vary, with best-case scenarios involving project and salary extensions<sup>1,2</sup>

and cash handouts<sup>3</sup> as immediate alternatives. Individuals at the planning stage of their research strategy may also consider eliminating fieldwork to produce a more realistic approach. This could be especially damaging to researchers pursuing shorter graduate degrees, as well as to those relying on time-sensitive academic visas. Ultimately, graduate students may also feel difficulties in completing their tasks and dissertation work, which can persist into their future academic career.

When considering long-term impacts, we can expect to see repercussions on scientific work, funding, and international collaborations. Continued delays in fieldwork will result in gaps in time-series data, while long-term impacts on the economy will affect the financial support of scientific investigations, and lead to either redirection or removal of research funding (Corlett et al., 2020). Indeed, many data collecting efforts on marine science involve public financing, which is presently at stake. Health and safety protocols must also be updated or restructured following current restrictions and precautions, especially for outdoor activities (e.g., diving, field samplings) and potential contact with others. One of the most substantial impacts, however, may be on networking. Social interactions in conferences are especially fruitful for early career researchers (Günther et al., 2015), and provide an invaluable opportunity to publicize one's findings and even lead to an increase in citations (Funk et al., 2012). Face-to-face conversation, accordingly, is more likely to reduce ambiguity and facilitate positive interactions than computer-mediated communication (Okdie et al., 2011) when interacting with other researchers during scientific events. While the canceling or delaying of conferences may appear to be only a short-term problem, it is just the beginning of a more severe issue where interactions for international collaboration may need to be rethought. We may now be facing changes in how we incorporate highly beneficial social interactions with other researchers.

The personal lives of each researcher can also affect their academic performance. We must also acknowledge that children in home-schooling and the (lack of) division of household chores during the pandemic can disproportionately take a heavier toll on women, thus contributing to an increase in gender inequality in science (Staniscuaski et al., 2020; Viglione, 2020). It is important to take into account the lack of psychological structure to confront the pandemic and loss of motivation. Indeed, mental health disorders can increase among the student community during this period (Zhai and Du, 2020), worsening something that was already problematic (Levecque et al., 2017; Andrews et al., 2020). Fortunately, universities worldwide are enabling free online counseling resources to students coping with stress and anxiety during this period<sup>4,5,6</sup>. Uncertain times such as these affect each individual uniquely, and it is complicated to measure and consider each case individually. An unexpected interference during one's research can result in negative impacts on their future career, independent of the research topic. Even upon

<sup>3</sup><https://www.japantimes.co.jp/news/2020/05/19/national/japan-approves-cash-handout-students-coronavirus/#.XsWz5mhKi00>

<sup>4</sup><https://www.imperial.ac.uk/counselling/>

<sup>5</sup><https://www.wits.ac.za/ccdu/personal-counselling-/covid-19-emotional-health-resources/covid-19-support/>

<sup>6</sup><https://www.uottawa.ca/wellness/covid-19/support-from-home>

<sup>1</sup><https://www.bundesregierung.de/breg-en/search/meldung-zeitvertraeg-1742262>

<sup>2</sup><http://www.fapesp.br/14080>

completion, it is uncertain if there will be job opportunities and whether disturbances during the pandemic may have impacted the researcher's qualifications. Research-associate positions are naturally highly competitive and the pandemic's economic fallout may impact job-searching after graduation<sup>7</sup>.

## ACTIONS TO ENSURE GRADUATE RESEARCHERS DEVELOP IN THIS PERIOD

Considering that marine graduate researchers will inevitably be affected by the pandemic in multiple ways, we need to move forward and consider, "What can we do now?". The following section explores some possible actions that universities, funding agencies, supervisors and graduates could apply to tackle these challenges. We show priority points that may substantially help marine graduate researchers and advance their work now and after this pandemic.

### Re-scheduling of Research Projects and Grants

Funding agencies and universities will need to consider as early as possible changes in research projects, international academic exchange periods, and grants to accommodate delays caused by the pandemic. While a case-by-case analysis may be adopted, an extension for all graduates is considered to be fair and allow graduate researchers to protect their private information (e.g., concerning their mental health). Some research areas may not have been directly affected (e.g., those working with computer modeling and possessing the necessary equipment/resources at home), but others relying on field or laboratory work may need extensions to conclude their research (Inouye et al., 2020). When possible, graduate researchers have modified their investigations to be online-based as a directive from their supervisor, but this is highly dependent on the study area. However, there are aspects of research that are not as flexible. In that sense, it is also essential that supervisors or funding bodies adjust their expectations to this new reality. Many marine graduate researchers will be unable to deliver the expected results, but with the right guidance they can adapt their projects to fit the allocated time and ultimately produce significant scientific outcomes.

### Supporting Online Conferences and Working Group Meetings

Scientific gatherings will undoubtedly be severely affected for the duration of the pandemic. Such events are an essential part of an academic career, providing an environment where researchers with shared interests are incentivized to communicate and collaborate. For instance, conferences offer an opportunity to interact with well-known senior researchers, and the chance for early career scientists to "put themselves out there", promote partnerships and find potential job positions (Günther

et al., 2015). Given the present difficulty in hosting gatherings dependent on physical attendance, we suggest that instead of postponing or canceling events, organizing committees should instead aim to facilitate online meetings. Yet, we understand that in-person conferences should not be permanently replaced by online events, given the former offer unique opportunities with several networking benefits for young researchers (Günther et al., 2015; Gopalan et al., 2018).

Coming up with online alternatives will initially be difficult. Therefore, we propose short pre-recorded sessions and symposia/workshops/webinars (1–2 h each) spread out over several weeks to accommodate attendants from different backgrounds. Spacing out sessions would also ensure that more people are able to participate. As for the necessary online resources, one possible solution is through online repositories, capable of storing large amounts of data in the form of posters and video files. Attendants unable to participate at specific times could join dedicated group chats to answer any questions pertaining to their work/discussion topic.

Finally, these events also have the advantage of being far less costly, with the possibility of being available free of charge or at a reduced fee. When offering online services as a substitute for real-life presentations, scientific meetings can: (1) offer the opportunity for new research to be discussed and advanced; (2) become even more inclusive to early career researchers who would be financially unable to travel to the event location in the first place and (3) reduce carbon emissions due to travel and general transportation. For instance, conference attendance can correspond to 35% of the carbon footprint during a doctoral degree (Achten et al., 2013).

### Using Existing Technologies to Foster Collaboration During Quarantine

Periods of social isolation may still continue in the near future. To overcome this problem in a short-term time scale, research groups must take advantage of the many online tools available to communicate and collaborate. Supervisors should facilitate communication between all laboratory members via remote group meetings but also provide an environment for consistent one-to-one discussions with their students. There are many free and easy to use cloud-based instant messaging alternatives, like Whatsapp and Telegram. More advanced tools (e.g., Slack and Mattermost) enable the creation of a laboratory workspace, as well as setting teams for each project<sup>8</sup>. Regular video meetings are encouraged to guarantee that work is still being carried out within expectations (see Powell, 2020 for more tips on inclusiveness). For this, there is a myriad of software, like Skype and Google Meet.

A second step is implementing tools to enable collaborative work during isolation. Teams can use cloud edition to work on documents and data analysis. Indeed, there is already an effort to turn marine data publicly available online and to create platforms for cloud analysis of marine data (e.g., Míguez et al., 2019). It is also possible to implement project-management tools that help to organize and accompany the

<sup>7</sup><https://www.thecrimson.com/article/2020/4/24/harvard-coronavirus-gsas-job-prospects/>

<sup>8</sup><https://www.nature.com/articles/d41586-019-01375-4>

workflux of a project (some interesting tools are Trello, Asana and Basecamp, all providing a free version). A combination of these solutions, from communication to project management, can increase productivity during this period and enable projects to remain on track. These tools can improve laboratory work even after the pandemic, bringing together other benefits to make research more open and inclusive (Powell, 2020). However, the mentioned solutions imply that graduates have access to the necessary tools – computer, smartphone, and internet access – which may not be trivial in many parts of the world. Universities and marine research centers have to find ways to guarantee basic technological access to graduate researchers to enable remote working.

## Ensuring Academic Development Through Online Classes and Courses

Classes and courses constitute an essential part of the academic pathway of graduate researchers. To overcome campus closure, universities can adopt online classes. Indeed, many universities are already offering online classes through web-conference tools or in video format. This is essential if we want to keep providing the knowledge basis for marine graduates. However, we have to take into account that there might be issues with this format. First, universities have to ensure that students have access to the internet. Although this incurs costs for universities, this is a critical point if we want to avoid deepening social inequity in science, and is achievable as already demonstrated<sup>9</sup>. Second, making the switch to online classes is challenging and demands teachers to use different strategies (Gewin, 2020). Finally, many aspects of courses may be lost during this period, such as practical or field-based classes, important components for those in marine science. In that sense, lecturers have to find alternatives, for example videos of shipboard sampling practices and analytical procedures.

On the other hand, online classes provide unique opportunities to share knowledge beyond the university; departments, for example, can share their classes to a broader community via video platforms. This can even enhance public awareness about ocean-related topics. Additionally, online classes enable inviting guest researchers from different parts of the world to teach a specific subject or to participate in a discussion without additional costs to the university. So, although online classes can prove challenging at first, they have a great reward potential. Graduates can also help to improve online classes by offering feedback to their departments and lecturers. Thankfully, while the retraining of academic staff could well become a necessity, universities should strive to offer open courses on online teaching, as some free initiatives are already taking place<sup>10,11</sup>.

While capacity building initiatives and programs worldwide will continue as key strategies to promote development of marine science and ocean health (Schmidt et al., 2019;

<sup>9</sup><https://jornal.usp.br/institucional/usp-distribui-mais-de-2-mil-kits-internet-para-estudantes-com-necessidades-socioeconomicas/>

<sup>10</sup><https://www.futurelearn.com/courses/teach-online>

<sup>11</sup><https://www.coursera.org/learn/teach-online>

**TABLE 1** | Online repositories of resources for marine graduate researchers (examples below).

Organization	What is offered	Web page
CJB Network	Advertise academic/job positions, courses	<a href="https://www.cjbnetwork.com/">https://www.cjbnetwork.com/</a>
Climate and Ocean: Variability, Predictability and Change (CLIVAR)	Offer and advertise academic/job positions, courses, scientific events	<a href="http://www.clivar.org/">http://www.clivar.org/</a>
EUROMARINE (European Marine Research Network)	Advertise academic/job positions, courses, scientific events	<a href="http://www.euromarinetwork.eu/">http://www.euromarinetwork.eu/</a>
Future Earth	Offer and advertise scientific events, advertise academic/job positions	<a href="https://futureearth.org/networks/knowledge-action-networks/ocean/">https://futureearth.org/networks/knowledge-action-networks/ocean/</a>
IMBeR (Integrated Marine Biosphere Research)	Offer courses academic/job, positions, scientific events,	<a href="http://www.imber.info/">http://www.imber.info/</a>
MARINE-B (Marine Research Information Network on Biodiversity)	Advertise academic/job positions, courses, scientific events	<a href="https://listserv.heanet.ie/cgi-bin/wa?AO=MARINE-B">https://listserv.heanet.ie/cgi-bin/wa?AO=MARINE-B</a>
MarineTraining.eu	Advertise courses	<a href="http://www.marinetraining.eu/">http://www.marinetraining.eu/</a>
NF-POGO Alumnt Network for Oceans (NANO)	Advertise academic/job positions, courses, scientific events	<a href="https://nfp-pogo-alumni.org/about/opportunities/">https://nfp-pogo-alumni.org/about/opportunities/</a>
NOAA (National Oceanic and Atmospheric Administration)	Offer courses	<a href="https://coast.noaa.gov/digitalcoast/about/">https://coast.noaa.gov/digitalcoast/about/</a>
OTGA (Ocean Teacher Global Academy)	Offer courses	<a href="https://classroom.oceanteacher.org/">https://classroom.oceanteacher.org/</a>
Ocean Oculus	Advertise courses, academic/job positions, scientific events	<a href="https://www.oceanoculus.com/news-from-the-sea/ocean-opportunities">https://www.oceanoculus.com/news-from-the-sea/ocean-opportunities</a>
Ocean Training Partnership	Offer and advertise courses	<a href="http://www.oceantrainingpartnership.org/current-training">http://www.oceantrainingpartnership.org/current-training</a>
OpenChannels	Offer and advertise academic/job positions, courses, scientific events	<a href="https://www.openchannels.org/">https://www.openchannels.org/</a>
POGO (Partnership for Observation of Global Ocean)	Offer courses	<a href="http://www.ocean-partners.org/training-education">http://www.ocean-partners.org/training-education</a>
SEVENSEAS Media	Advertise academic/job positions	<a href="https://sevensasmedia.org/ocean-jobs/">https://sevensasmedia.org/ocean-jobs/</a>
The Academy by DHI	Offer courses, scientific events	<a href="https://www.theacademybydhi.com/">https://www.theacademybydhi.com/</a>

Stammer et al., 2019), an emphasis on virtual-oriented strategies should now be taken into account. We compiled in **Table 1** some important repositories for courses, academic/job positions and scientific events (webinars, conferences) of current and near-future relevance for marine graduate researchers. Apart from the mentioned sources, online shared repositories (e.g., Gradworksheet – jobs, volunteer, travel grant and scientific databases opportunities, <https://bit.ly/gMar20Fron>; Ocean webinars, <https://bit.ly/yMar20Fron>) and massive open online course providers such as edX<sup>12</sup>, Coursera<sup>13</sup>, and FutureLearn<sup>14</sup> are also relevant resources for graduate researchers.

## Creating Online Groups for Young Researchers in Marine Science

Given the suspension or slowing down of research activities, many researchers are, when possible, optimizing their time by working on the theoretical aspects of their subject, building capacities/skills (e.g., GIS, coding) and developing project ideas with colleagues from their network. Online groups on social networks (e.g., Marine Biologist network and job postings)<sup>15</sup>, and other platforms allow us to bring together researchers from all over the world to discuss issues and challenges, and share opportunities. This dynamic of exchange and sharing could

lead in the short and medium term to collaborative research in marine science.

## OPPORTUNITIES TO MARINE SCIENTISTS ARISING FROM THIS NEW REALITY

As all members of society, marine graduates are concerned primarily with their health, their families and the impacts of the pandemic on their career. If the marine science community is able to implement solutions to thrive despite this situation, we can also look forward to emerging opportunities. First of all, this period can generate new vocations and interest in education and research in marine science, as the general public have been made aware of the links between biodiversity conservation and human well-being. Several efforts have arisen to better understand the impact of COVID-19 in our coastal and marine environments, including citizen science (for example the eOceans initiative)<sup>16</sup>. Marine scientists have become more involved in public outreach by sharing their knowledge with the public via webinars<sup>17</sup>. This pandemic has reinforced the need for collaboration through virtual research environments across all aspects of marine science. Regarding research, this period may also encourage further development and potential academic positions in certain sectors of marine science. Marine organisms have demonstrated

<sup>12</sup><https://www.edx.org/>





<sup>13</sup><https://www.coursera.org/>

<sup>14</sup><https://www.futurelearn.com>

<sup>15</sup><https://www.facebook.com/groups/39975981246>

<sup>16</sup><https://www.eoceans.co/project-covid19>

<sup>17</sup><https://www.forbes.com/sites/farahqaiser/2020/03/24/10-ways-scientists-can-help-during-the-covid-19-coronavirus-pandemic/#46bf8130a901>

	 Personal	 Academic	 Team	 Research
CHALLENGES	Frustration of plans Mental health problems Work from home: child/familiar issues	Delay of classes Postponement of conferences and courses Unavailability of tech tools (computer/internet)	Keep teamwork on track during isolation Enable collaboration Keep motivation	Delay of fieldwork and experiments Pause in long-term experiments Delay in funded research (grant period)
SOLUTIONS	Supervisor support University/institute support Collaborative groups Use of online tools	Online conferences Online classes Collaborative groups	Use of online tools for project management Use of online tools for communication	Extensions by funding agencies and universities Create connections with other researchers Amend projects/establish new objectives
OPPORTUNITIES	Improvement of self- organizing Enhancement of collaboration between graduate researchers	Increase attendance of low-income researchers in conferences New research ideas	Incorporate project management tools in lab work Enhance collaborative work	Isolation will produce non- disturbed periods that can be used for experiments/ research. Development of new potential academic positions in marine science

**FIGURE 1 |** Challenges, solutions, and opportunities for graduate researchers in marine science.

a vast potential as a source for several pharmaceuticals mainly due to their range of specific secondary metabolites (Lindequist, 2016). Reduction or absence of anthropogenic disturbances may also promote an ideal opportunity for studies on marine wildlife behavior and ecology<sup>18</sup> (Bates et al., 2020). Reduced number of tourists, lower levels of noise pollution, boat-generated waste and recreational fishing, for instance, may allow research on the pressures faced by the marine environment, the efficacy of marine protected areas, and on baselines for non-disturbed periods (e.g., Rolland et al., 2012).

## CONCLUDING THOUGHTS

The COVID-19 pandemic has changed the world. As the pandemic period continues and other isolation periods are expected, we propose solutions that can be adopted by institutions, supervisors, and graduates to overcome this situation. Apart from the importance of showing immediate and expected challenges, solutions and opportunities (summarized in **Figure 1**), it is crucial to keep updating the list of technologies and strategies to deal with future similar situations. Graduate researchers are important actors in the marine science research community, being considered, for instance, to be at the core of the United Nations Decade of Ocean Science for Sustainable Development (2021–2030) (Intergovernmental Oceanographic Commission [IOC], 2019). Although there are aspects that we may not have taken into account, this article covers the main topics identified among our peers. We should also mention that several of these recommendations can be applied to other segments of science, and not necessarily confined to marine science and graduate researchers.

Many, if not all, of these challenges will require a joint effort of all involved in marine science research. As a contribution to the community, we are launching a Twitter account (Marine Graduate Opportunities – @mar\_opps) as a repository for opportunities for graduates in marine science, hoping the information will be used for other early career researchers at different levels. The community is also encouraged to post and share opportunities on social media via #marineopps, which may be reposted in our account. Despite being a small contribution,

<sup>18</sup> [https://www.theguardian.com/environment/2020/apr/27/silence-is-golden-for-whales-as-lockdown-reduces-ocean-noise-coronavirus?CMP=share\\_btn\\_tw](https://www.theguardian.com/environment/2020/apr/27/silence-is-golden-for-whales-as-lockdown-reduces-ocean-noise-coronavirus?CMP=share_btn_tw)

## REFERENCES

- Achten, W. M., Almeida, J., and Muys, B. (2013). Carbon footprint of science: More than flying. *Ecol. Indic.* 34, 352–355. doi: 10.1016/j.ecolind.2013.05.025
- Andrews, E. J., Harper, S., Cashion, T., Palacios-Abrantes, J., Blythe, J., Daly, J., et al. (2020). Supporting early career researchers: insights from interdisciplinary marine scientists. *ICES J. Mar. Sci.* 77, 476–485. doi: 10.1093/icesjms/fsz247
- Bates, A. E., Primack, R. B., Moraga, P., and Duarte, C. M. (2020). COVID-19 pandemic and associated lockdown as a “Global Human Confinement Experiment” to investigate biodiversity conservation. *Biol. Conserv.* 108665. doi: 10.1016/j.biocon.2020.108665

we hope it will add to the efforts to advance the academic career of marine graduates during this period. We believe that if we work together, we can still grow in spite of this great challenge.

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

## AUTHOR CONTRIBUTIONS

JP and SP conceived and designed the perspective. All authors contributed equally to the writing and critically revised the text.

## FUNDING

GS-S and LL were covered by a grant from the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brazil (CAPES) – Finance Code 001. GS-S was also supported via the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) (grant #2018/19278-2).

## ACKNOWLEDGMENTS

We wish to thank all our marine science colleagues who provided important insights so to bring this perspective together. We also thank the universities, institutes, and research foundations for supporting graduate researchers during this uncertain period. Special thanks to Dr. Lilian Krug (Partnership for Observation of the Global Ocean and the NF-POGO Alumni Network for Oceans) and Prof. Peter Croot (National University of Ireland, NUI Galway) for the information and comments provided. We also thank our editor DK and the reviewers JC, KW, and SF for their valuable inputs on the manuscript. Lastly, we thank the University of Agder (UiA) for offering to provide Open Access funding and Frontiers [Dr. Nina Hall (Rothe) and Editorial Office team] for waiving the fees of our perspective article.

- Corlett, R. T., Primack, R. B., Devictor, V., Maas, B., Goswami, V. R., Bates, A. E., et al. (2020). Impacts of the coronavirus pandemic on biodiversity conservation. *Biol. Conserv.* 246:108571. doi: 10.1016/j.biocon.2020.108571
- Funk, M., Hu, J., and Rauterberg, M. (2012). “December. Socialize or perish: relating social behavior at a scientific conference to publication citations,” in *Proceedings of the 2012 International Conference on Social Informatics*, (Piscataway, NJ: IEEE), 113–120. doi: 10.1109/SocialInformatics.2012.48
- Gewin, V. (2020). Five tips for moving teaching online as COVID-19 takes hold. *Nature* 580, 295–296. doi: 10.1038/d41586-020-00896-7
- Gopalan, C., Halpin, P. A., and Johnson, K. M. (2018). Benefits and logistics of nonpresenting undergraduate students attending a professional scientific meeting. *Adv. Physiol. Educ.* 42, 68–74. doi: 10.1152/advan.00091.2017

- Günther, I., Grosse, M., and Klasen, S. (2015). *Attracting Attentive Academics: Paper, person or place?*. Center for European Governance and Economic Development Research Discussion Papers 250. Goettingen: University of Goettingen, doi: 10.2139/ssrn.2623580
- Inouye, D. W., Underwood, A., Inouye, B. D., and Irwin, R. E. (2020). Support early-career field researchers. *Science* 368, 724–725. doi: 10.1126/science.abcl261
- Intergovernmental Oceanographic Commission [IOC] (2019). *United Nations Decade of Ocean Science for Sustainable Development (2021–2030): update on preparations, call for a review of Draft Implementation Plan and for joining the Global Ocean Decade Alliance*. Paris: Intergovernmental Oceanographic Commission.
- Kissler, S. M., Tedijanto, C., Goldstein, E., Grad, Y. H., and Lipsitch, M. (2020). Projecting the transmission dynamics of SARS-CoV-2 through the postpandemic period. *Science* 368, 860–868. doi: 10.1126/science.abb5793
- Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., and Gisle, L. (2017). Work organization and mental health problems in PhD students. *Res. Policy* 46, 868–879. doi: 10.1016/j.respol.2017.02.008
- Lindequist, U. (2016). Marine-derived pharmaceuticals—challenges and opportunities. *Biomol. Ther.* 24:561. doi: 10.4062/biomolther.2016.181
- Míguez, B. M., Novellino, A., Vinci, M., Claus, S., Calewaert, J. B., Vallius, H., et al. (2019). The European marine observation and data network (EMODnet): visions and roles of the gateway to marine data in Europe. *Front. Mar. Sci.* 6:313. doi: 10.3389/fmars.2019.00313
- Okdie, B. M., Guadagno, R. E., Bernieri, F. J., Geers, A. L., and Mclarney-Vesotski, A. R. (2011). Getting to know you: Face-to-face versus online interactions. *Comput. Hum. Behav.* 27, 153–159. doi: 10.1016/j.chb.2010.07.017
- Powell, K. (2020). Tech tools to make research more open and inclusive. *Nature* 578, 181–182. doi: 10.1038/d41586-020-00216-z
- Rolland, R. M., Parks, S. E., Hunt, K. E., Castellote, M., Corkeron, P. J., Nowacek, D. P., et al. (2012). Evidence that ship noise increases stress in right whales. *Proc. R. Soc. B* 279, 2363–2368. doi: 10.1098/rspb.2011.2429
- Schmidt, J. O., Bograd, S. J., Arrizabalaga, H., Azevedo, J. L., Barbeaux, S. J., Barth, J. A., et al. (2019). Future ocean observations to connect climate, fisheries and marine ecosystems. *Front. Mar. Sci.* 6:550. doi: 10.3389/fmars.2019.00550
- Servick, K., Cho, A., Guglielmi, G., Vogel, G., and Couzin-Frankel, J. (2020). Updated: labs go quiet as researchers brace for long-term coronavirus disruptions. *Science*. doi: 10.1126/science.abb7259 (accessed April 24, 2020).
- Stammer, D., Bracco, A., Achutarao, K., Beal, L., Bindoff, N., Braconnot, P., et al. (2019). Ocean climate observing requirements in support of Climate Research and Climate Information. *Front. Mar. Sci.* 6:444. doi: 10.3389/fmars.2019.00444
- Stanislauski, F., Reichert, F., Werneck, F. P., de Oliveira, L., Mello-Carpes, P. B., Soletti, R. C., et al. (2020). Impact of COVID-19 on academic mothers. *Science* 368, 724–724. doi: 10.1126/science.abc2740
- Viglione, G. (2020). Are women publishing less during the pandemic? Here's what the data say. *Nature* 581, 365–366. doi: 10.1038/d41586-020-01294-9
- Zhai, Y., and Du, X. (2020). Addressing collegiate mental health amid COVID-19 pandemic. *Psychiatry Res.* 2020:113003. doi: 10.1016/j.psychres.2020.113003

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2020 Pardo, Ramon, Stefanelli-Silva, Elegbede, Lima and Principe. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.