



YOUNG
EARTH SYSTEM
SCIENTISTS
community

Early Career Earth system scientists during COVID-19 crisis: Lessons learned from an open survey

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Background

The year 2020 surprised us in the most unexpected way and turned our lives upside down in a blink of an eye. Most of our scheduled or planned activities were postponed or canceled. The spread of COVID-19 had completely transformed our daily lives in one way or another.

This anomalous situation and the measures taken to fight against this pandemic have different impacts amongst Early Career Researchers (ECRs). With the goal of understanding the experiences and challenges of ECRs in Earth sciences, the Young Earth System Scientists (YESS) Community prepared a survey where ECRs were able to share their experiences, both professional and personal, during the current global crisis.

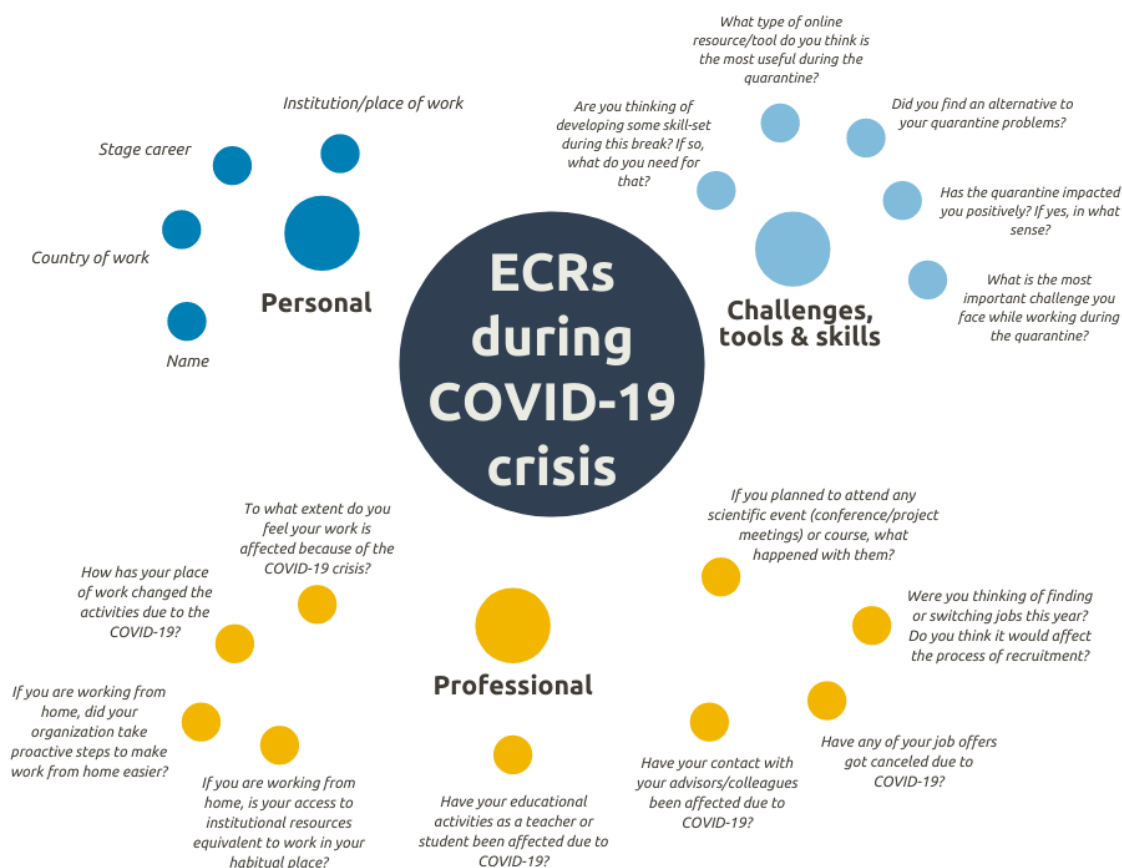
In two months, we received **197 responses**¹ from all over the world. From undergraduate students to junior professors, we saw that the pandemic is affecting, at least in some way, the life of every young scientist who filled the survey.

Each personal experience is unique and everyone is facing their own challenges regarding work or life. With this report, we want to highlight the different perspectives during the COVID-19 crisis as ECRs and also make recommendations to help the community to better prepare for the uncertain future.

¹ The survey was open between April 7th and June 16th 2020.

The survey

In the form that was distributed in the YESS social media, we asked **19 questions** (13 mandatory questions and 6 optional). Here's the list of questions that 197 ECRs filled with their own experiences:



The information that the ECRs gave to us is the main input of this report and the results are shown in the following section (Results).

Results

Most of the participants of the survey are students² (61.3%) or post-docs (33%), facing challenges related to completing their educational programs in proposed times (Figure 1). Most of the respondents are associated with the universities and non-university research institutes, while a small percentage of the participants are with local, regional, or national governments (Figure 2).

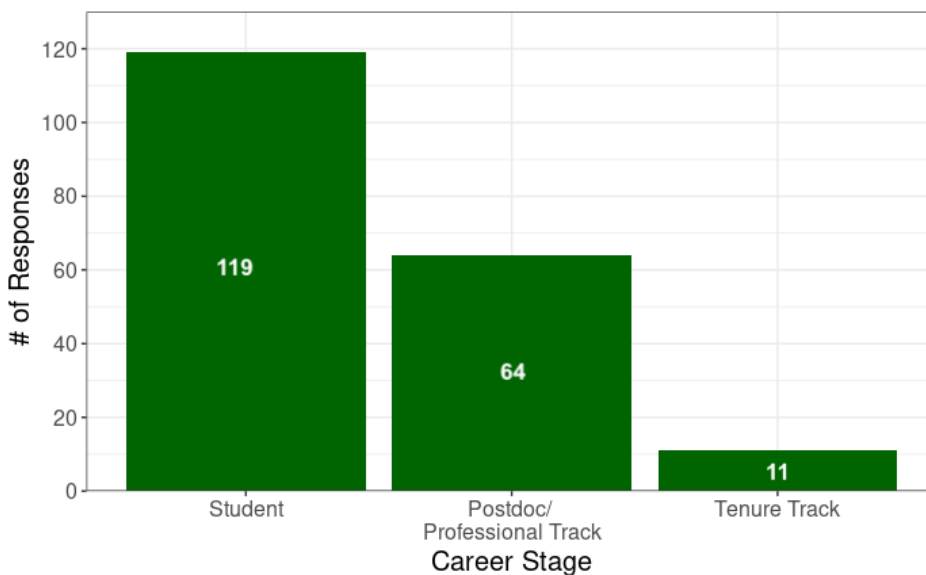


Figure 1: Career stage of people who participated in the survey.

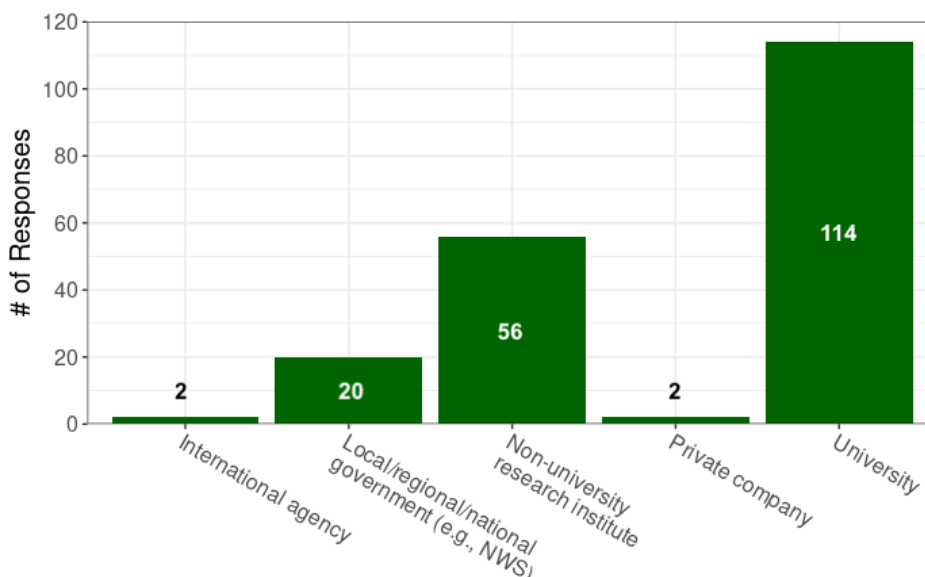


Figure 2: Institutions where the samples were collected.

² The career stage *Student* includes Bachelor, Master and PhD students.

The largest number of responses came from Europe (51.5%), but with also a considerable number from ECRs living in South America (13.9%), Africa (12.9%), South East Asia (12.9%), and North America (6.7%). Unfortunately, the number of responses from Central Asia and South-West Pacific is very low (1%)³, which may not represent the overall experiences of ECRs in these regions during the COVID-19 crisis.

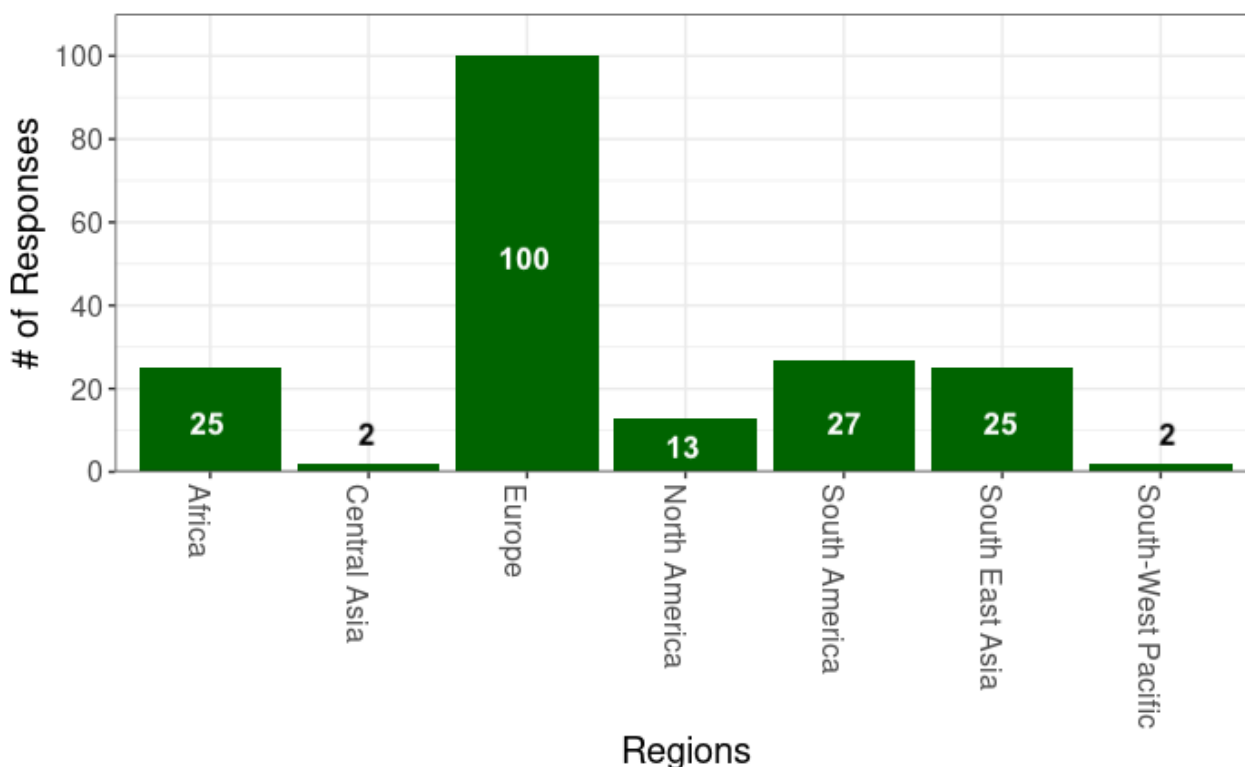


Figure 3: Regions that participated in the sampling.

Around 96% of the participants reported that their work has been affected in some way because of the COVID-19 crisis to different degrees. In particular, around 36% feel that their work has been mostly or totally affected, while 39% of the ECRs reported that their jobs have been somewhat affected.

One of the main impacts is related to the place of work: a high number of participants have been forced to move online (with a high number of people doing their activities from home) or stopped their activities, with less than 6% who didn't experience any change on this matter.

³ To know more about how YESS' membership database is organized, please visit the YESS website: www.yess-community.org/aboutus/structure.

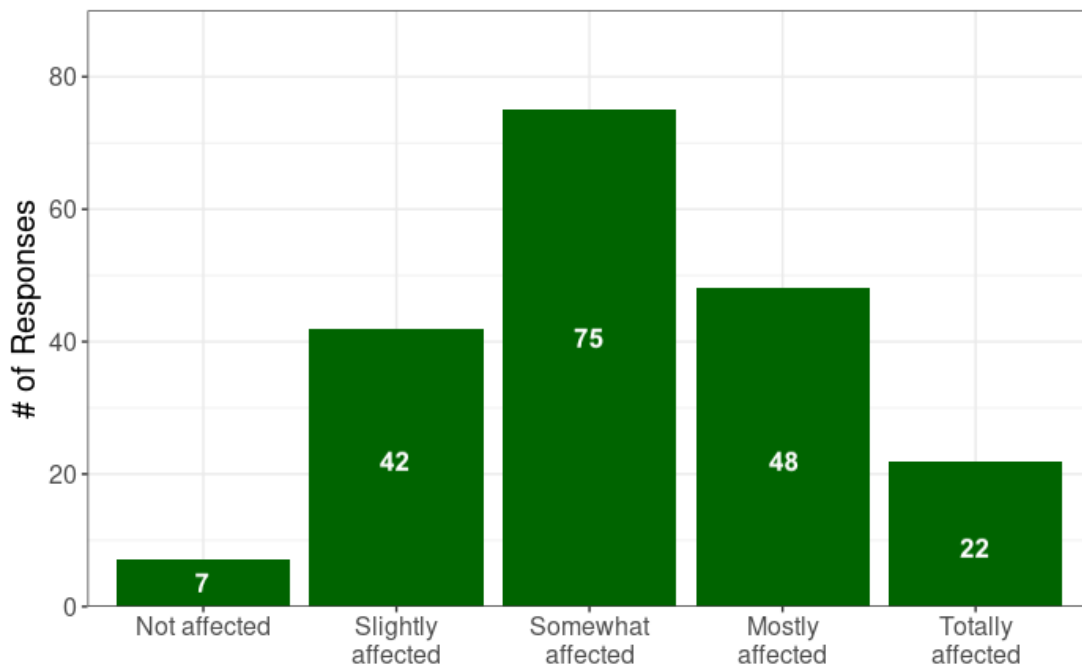


Figure 4: Work situation of each ECR during the COVID-19 crisis.

Multiple challenges arose from the COVID-19 crisis that have affected our daily routine and work. 69 people reported that their biggest challenge is related to personal aspects, such as hardship in concentration, loneliness, lack of motivation, distance from the work environment, anxiety, the uncertainty of future jobs and reduction in productivity. 28 participants (out of 162 replies to this optional question) also reported issues related to their work plan including limited interactions with supervisors and colleagues, changes in their academic plans, canceled fieldwork, time management and financial budget problems.

Transitioning to working from home caused several challenges because surveyed ECRs don't always have the same access to work-required facilities as before. 32 of them reported that they have experienced difficulties in technical problems including access to scientific journals, unstable internet and limited access to university resources and/or robust computing resources.

19 of the respondents reported challenges related to the change of workplace including difficulties to maintain work-life balance or the lack of an appropriate work environment at home. Moreover, closed schools and kindergartens are also sources of difficulties, especially for those who are caretakers to their family members. It has been very challenging to balance work responsibility while taking care of family members in the same physical environment.

To deal with the challenges during the crisis, ECRs reported that they have used different kinds of online resources and tools to replace the usual way of communication, learning or even doing research. Communication tools have emerged as the most useful ones during this anomalous situation, especially those related to teleconferences (89 responses). An increasing number of available online courses, training, webinars, and scientific events like workshops or conferences are considered a huge asset for learning and professional development by surveyed ECRs (19 responses).

Some survey participants (22 responses) also reported that they have benefited from accessing institutional resources using virtual private networks and remote computing resources (such as, virtual machines and connection to remote servers). Similarly, the open access to scientific publications through different publishers, online platforms and search engines has been extensively used by ECRs and is also considered an essential tool for the working-from-home situation (15 responses). Other resources/tools identified by surveyed ECRs include collaboration platforms, educational programs and tools, file storage services and public online data sets.

As the COVID-19 crisis has affected almost all ECRs, it also gave ECRs a long break from some of our regular activities. During this time, some ECRs have capitalized this time for developing new skills, mostly programming languages (e.g. Python, R, MATLAB, Fortran), learning new software (e.g., ArcGIS) and taking online courses (like statistics, remote sensing or machine learning). Some PhD students were able to devote all their available time to work on their PhD thesis so they may complete in time.

Recommendations

In response to the ongoing global pandemic, we have transformed how we conduct scientific work and deal with work-life balance because of different measures taken by governments and institutions. Even though we are all longing for life returning to normal, the timeline to achieve such a goal is not immediately clear.

Based on the responses of this survey, we were able to identify some lessons we learned that are most relevant for ECRs (but could be extended in some way to a larger community) and how we can create a virtual working environment that can support ECRs to sustain and succeed in the future.

- Foster **supportive communities**. Everyone needs a supportive community to help us get through difficult times like the COVID-19 crisis. Institutions and groups can facilitate **social activities** for ECRs to stay socially connected to avoid loneliness and anxiety. A supportive community will also allow ECRs to share experiences regarding how to adapt life and work to these exceptional times. At least 40% of ECRs reported that personal issues were the most challenging right now. To tackle this, YESS hosted several virtual coffee breaks during April and May.



- Guarantee proper **access to institutional resources, suitable equipment, and stable internet connection**. ECRs need these resources and access to continue their work. It is unfair to assume that all ECRs can solve this issue on their own. Institutions need to implement policies to help ECRs set up a productive and sustainable virtual working environment. [Here](#) you can find a list of online resources that can be used by any ECR who needs it.
- Increase **online engagement**. Virtual networks such as the YESS community, APECS, YHS and PAGES are examples of how to construct communities beyond face-to-face contact. These online engagement activities will allow ECRs to stay connected with peers who may share similar challenges and support each other to overcome issues (both professional and personal).
- Create **online opportunities for ECRs** about different topics and targets. Not only YESS but several institutions, groups or networks have been developing projects (like webinars or online courses) since the beginning of the pandemic crisis. These online opportunities allow ECRs to further advance their professional skills which is crucial for their future success. For instance, the YESS Community has been organizing activities such as the Twitter Poster Week, the [Science webinar series](#), the [YESS & HIWeather webinar series](#) and the [webinars for South American ECRs](#).
- Develop and promote **remote internships and fellowships**. Internships and fellowships are very important for ECRs both professionally and financially. Institutions should plan to develop and promote virtual internships and fellowships allowing ECRs to continue their research and work. This will also allow institutions to attract talented ECRs and expand their candidate pools without being limited to a specific region.
- **Tasks and schedules** should be highly flexible for those who are facing more challenging domestic situations (e.g., caretakers of family members). It would be desirable for institutions and universities to be more lenient with the ECRs who have not achieved the objectives assigned in the contract related to the COVID-19 pandemic.

Acknowledgement

We are thankful to the 197 early career researchers who participated in this survey. We extend our sincere gratitude to the YESS community, especially the Executive Committee, Regional Representatives, and members of the Working Groups for bringing out the idea of this survey of ECRs in the unprecedented crisis, analysis of the responses and presentation.