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by 20/12/2023

***NOTE: MAXIMUM LENGTH OF THE TEXT REPORT IS 5 (FIVE) PAGES (starting from question 1)**

List of Meetings (Section 3.2); Publications (Section 3.6); Financial Statement (Section 8) should be added as an Annex (See form IV-meeting report and form III-financial statement).

***REMINDER: if this is the final year of the project, please submit a review article about the project to the IUGS journal 'EPISODES'.**

The scientific information in this report will further be used for publications by UNESCO (*please feel free to attach any additional information you may consider relevant to the assessment of the project*).

IGCP project short title: OLLIN-Fault2SHA in Latin America (IGCP 669)

Duration: *Project was approved in 2020; 2023 is the second year we receive financial support*

Please tick this box if the report is for a Project on Extended Term (OET):

Project leader(s):

| | |
|--|---|
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Date of submission of report: 31st December 2023

Signature of project leader(s):

Guidelines for Annual Report

Please use the following headlines to report the present status and scientific achievements of your project (write N/A where not applicable) and explain abbreviations used in the report.

1. Website address(es) related to the project

The new website is <https://www.ollinproyecto.com/> (this one is not operative any more <https://geollin.org/>)

2. Summary of major past achievements of the project (maximum 250 words excluding 2023 achievements, not applicable for the 1st year of the project). Meetings are not considered as scientific achievements; they should be listed under heading 3.2 and as an annex file.

Past activities of the project focused in the consolidation and public presentation of the network. This was done by linking different research groups based in Latin-American (mainly) and Europe. Members of the network grew in numbers during 2022 up to 114. As a result of the different online meetings, the priorities of the project were agreed: **1) re-enforcing the training activity** of young researchers through online lessons accessible for all publics (available in the webpage) and through the **obtention of additional funds** to be able to offer the first training school and undertake some research activities. This implied the signature of agreements with different institutions (so far Geological Surveys and Geological Societies from Spain and Colombia), and **2) providing with our own platforms to be able to share publications**, propose Special Issues and to disseminate the initiatives of the different groups in the network, as well as those exchanges among different countries (mainly visiting doctoral students and professors).

3. Achievements of the project for 2023 only

3.1. General scientific and societal achievements (maximum 500 words)

(Meetings are not considered as scientific achievements, they should be listed under heading 3.2.)

- ***Please describe what tangible improvements has your project obtained?***

We have devoted our efforts this year to reinforce our collaborations in terms of scientific research and training. The network has increased from 114 to 140 members, including new members from Colombia and Ecuador and from Central America (Costa Rica), where next year we plan to stablish a new working group. This year, the social media started to have more activity. We launched a new and improved webpage.

*The scientific achievements are reflected in **25 contributions made in the 3 international meetings** were IGCP-669 was present (detailed in the annexes), the publications of **two papers** with special acknowledgment to the IGCP program (León-Loya et al., 2023; Ortuño et al., 2023) and the obtention of a research project born from the collaboration of members of the network and led by two of the proposers, Pierre Lacan and Laurence Audin (Project sponsored by ECOS NORD México-Francia (CONACYT-ANUIES), with a budget of 16000 USD, entitled "Obtención de datos de paleosismología y su integración en el cálculo del peligro sísmico en el Cinturón Volcánico Trans-Mexicano".*

The main achievement of the project this year was the organization of the first training school focused on Fault2sha tools in Latin America, hold in Bogotá (Colombia, 4-7 July). The course had a large hands-on component aimed to train researchers in the use of OpenQuake and other fault2SHA tools (FISH, Sherifs), preceded of lessons on basic topics of active tectonics (morphotectonics, paleoseismology, dating, seismic hazard). It counted with 13 highly specialized instructors (check the flyer of the course) and the participation of 25 attendants on-site and 31 online. Some months later, the IGCP669 offered a short course (6h) on Active tectonics led by María Ortuño and organized by Oswaldo Guzmán and Corina Campos (Univ. IKIAM), which took place linked to the REDU congress in Ikiam (Ecuador) on the 7th December. It counted with 29 participants and included a short visit to a paleoseismological outcrop in the surroundings.

- **Please describe how this project specifically benefited female scientists, young scientists and scientists from developing countries.**

All the 17 beneficiaries (see financial statement), come from developing countries. Among them, 15 are considered early career researchers or students, and 6 of them are women. We have to acknowledge that the gender balance among the beneficiaries (6women/11men) this year is not as good as last year. The low number of women registered in the training course of Bogotá made it difficult (all women registered, 4, were financially supported, in any case). However, the gender balance of the network (40% women, slightly larger than in global terms for the STEM fields which is 30%) is remarkable. Also, the number of women providing the lessons was high (5 among 13). For next year, we would like to strength our activities with a larger gender-perspective in order to contribute to the progressive improvement of these numbers. As an example of this commitment, the main leader of the project has participated as main editor in a special issue focused on Women in Structural Geology and Tectonics (in *Frontiers*, attached), in which two of the members of the network have contributed with papers. We regret however that we could not include publications of women working in developing countries.

The budget of the project has been mainly used to support the attendance of young researchers from developing countries to the first training school in Bogotá, Colombia. Only one of the 10 beneficiaries in the training school was senior (Gloria López). Also, two other female members were supported to attend the INQUA congress in Rome (Stella Moreiras, senior Argentina; Tamara Briceño, PhD student, Ecuador). Finally, John J. Gallego (Colombia, recent PhD student) received partial sponsor (one-night hostel) to attend the first meeting of an European project in which he finally got involved for his PhD (Tread project; <https://tread-horizon.eu/>).

- **Please describe project contribution to the UN2030 agenda, Sustainable Development Goals (SDGs) and global initiatives:**

The project aims to increase the preparedness to face and anticipate seismic hazard. Accordingly, it is aligned with many of the SDGs (1, 2, 3, 8, 9) since the economic impact of large earthquakes often hits all these objectives of development. At the same time, we encourage participation and visibility of women in science (SDG 5) and specially, the support to developing countries which are majority within the network members (SDG 10).

3.2. List of IGCP project meetings/symposia in 2023 (please provide Form IV as attachment file).

We have been present in the following meetings.

- 1) **INQUA 2023.** A total of 7 contributions (5 orals and 2 posters) were presented (among 15 evaluated) in the 184 special session of the INQUA congress (14th July), focused on the IGCP 669 under the title “Seismic hazard assessment in populated areas of Latin America: incorporating seismogenic faults” <https://inquaroma2023.org/conference-sessions/>.
- 2) **UGM 2023.** A total of 13 contributions were presented in the Special Session of OLLIN IGCP 669, hold in the Union Geofisica Mexicana UGM 2023 annual meeting 29 october-3rd November in Puerto Vallarta (Mexico) (<https://www.raugm.org.mx/resumenes/sessions/session.php?sessionID=21>)
- 3) **REDU 2023.** A total of 4 communications and one invited talk (<https://www.ikiam.edu.ec/ciredu/index.php/conferencistas-invitados/>) by M. Ortuño- under the frame of the IGCP 669 project were presented in the X CIREDU international meeting <https://www.ikiam.edu.ec/ciredu/> (5th December)
- 4) Maria Ortuño contributed to the **Annual IGCP meeting of China**, with an invited presentation of the IGCP 669 updates.

3.3. What kinds of activities in respect to society and science outreach has the project undertaken?

We have been visible in social media (twitter, Instagram and web page) ensuring the dissemination of the activities of the network and of the scientific papers related to the project. This- year, we count with two indexed articles directly related to the project, 25 communications and two invited talks to national

and international meetings (see annex). We considered that the most relevant contribution to society this year is the educational activities: The First OLLIN training school (4 days, Bogotá, Colombia) and the Short Course in Active tectonics (1 day, Ikiam, Ecuador).

3.4. List of countries involved in project delivery.

The project is focused in Latin America megacities. The countries that are currently active in the activities are Mexico, Colombia, Ecuador, Venezuela, Perú, Argentina, Chile, Spain, France and Italy. A new country has joined this year; Costa Rica.

3.5. Participation of international scientists to project meetings

The following numbers are extracted from the list of participants of the three group meetings (see attached excel file "Participation General" for row numbers and names of participants).

| | Total number of scientists | Number of male scientists | Number of female scientists |
|---|----------------------------|---------------------------|-----------------------------|
| Number of participating scientists | 42 | 17 | 25 |
| Number of young scientists/students (<35 years old) | 21 | | |
| Number of scientists from developing countries | 34 | | |

The following numbers are extracted from the list of participants of the two training activities organized this year (see attached excel file).

| | Total number of scientists | Number of male scientists | Number of female scientists |
|---|----------------------------|---------------------------|-----------------------------|
| Number of participating scientists/technical staff/students | 85 | 48 | 37 |
| Number of instructors | 13 | 8 | 5 |
| Number of young scientists/students (<35 years old) | 46 | | |
| Number of participants from developing countries | 85 | | |

3.6. Provide a list of this year's publications (including maps)

a. could not have been published if not for this project and acknowledged as an IGCP project

All the communications and posters (a total of 25) presented in the above-mentioned meetings acknowledged the sponsorship or support of UNESCO-IUGS. Two of the indexed papers published by the network specifically include the IGCP in the acknowledgments and are attached.

-León-Loya R., Lacan P., Ortuño M., Zúñiga R. Štěpančíková, P., Stemberk, J., Hernández Flores, A.P., Carrera Hernández, J.J., Sunyé-Puchol, I., Aguirre-Díaz, G.J., Audin, L. (2023) Paleoseismology of a Major Crustal Seismogenic Source Near Mexico City: The Southern Border of the Acambay Graben. *Tectonics*. 42, 6, 2022TC007610. <https://doi.org/10.1029/2022TC007610>

-Ortuño M, Scheck-Wenderoth M and Oliva SJ (2023), Editorial: Women in science: structural geology and tectonics 2022. *Front. Earth Sci.* 11:1344815. doi: 10.3389/feart.2023.1344815

b. related to this project

After the special issue in 2021 (led by focused on the project, we are now preparing a new call for a second special issue in the *Journal of South American Earth Sciences*). Publication of the participants related to the project aims are periodically updated in our web page (<https://www.ollinproyecto.com/>)

c. did you publish in Episodes during the project's duration or plan to do so? If not, why?

We are planning to publish a summary of our work in Episodes during the coming year, once the results of the network are more consolidated.

3.7. Activities involving other IGCP projects, UNESCO programmes, IUGS Commissions or Task Groups or others

-Maria Ortuño was invited to the Annual IGCP meeting of China hold on the 19 and 20th of December with an online talk (now available in our webpage). China National Committee for IGCP acknowledged this collaboration and mentioned that the talk attracted a number of Chinese geologists, including many geoscience students and young geoscientists (letter in the attached documents).

3.8. Scientific Legacy: Is there a need for storage of publications, field data, and other results of the project? Do you have a clear vision concerning where the data would be stored and who will be the custodian?

So far, we have no generated a sufficient amount of data. We have the reference of publications listed in our website and the links to the two key-note lectures of the annual meeting in the you tube channel (<https://www.youtube.com/@IGCP696>), with permission of the invited speakers.

3.9. What kind of public information (media reports, social media, etc.) has the project generated? And how is their impact evaluated?

Social Media where we have announced and shared the main news of the project

@OllinIGCP669 (twitter) with 120 followers (45 more than last year)

Ollin_igcp669 (Instagram) with 86 followers (52 more than last year)

You tube channel: <https://www.youtube.com/@IGCP669> (145 visualization of the lessons we uploaded last year)

We also have complied a questionnaire after the 4 days training school in Bogotá (reflected in the attached report).

3.10. Project highlight:

Within this 2023, we have been able to keep with the group activities through the 3 symposia in which we participated, 2 of them with special sessions devoted to the project and 2 of them with after-session group meetings to plan new activities for the coming year and promote collaborations. The most relevant activities this year are educational. Accordingly, we trained a group of 25 on-site students (and 31 online) in the first OLLIN training school (Colombia, 4 days long with hands-on on fault2SHA tools), which required a large effort of organization (with IGME, SGC and SCG) but had excellent results, and of 29 students in a one-day short course (in Ikiam, Ecuador). We think this training activities are fundamental, since the aim of the project (improving seismic hazard) requires a better preparation of scientists in the target countries in order to produce significant impact in the society.

4. Project response:

We have spent all the amount approved, giving the details in the annexed III form.

Regarding the recommendations made in the 2022 evaluation, we have done an effort in communicating through the consolidated social media (specially Instagram, twitter). We also have renewed the web page, which we use to storage the documents of the project and to announce the training course and meetings. Among the scientific journal articles published this year, two of them include the IGCP acknowledgment.

5. Deviations/changes from initial project proposal: No deviations from the proposed plan

6. Activities planned for 2024

6.1. General goals

During 2024, our main goal is to organize a second training school. The most plausible location for it is in Argentina, linked to the XXII Congreso Geológico Argentino (responsible: Stella Moreiras, coorganized by other colleagues in the region). Some of the instructors of the first school (as Julian García-Mayordomo) already expressed their intention to collaborate in this second school. We are also committed with the organization of online lectures, which we could not perform in 2023.

6.2. Tentative list of specific meetings and field trips (please list expected participating countries)

Additional goals are to support participation of ECRs in the PATA-days congress in Chile, where we plan to have the annual meeting. <https://www.patadayschile.cl/>

Also, participation in the LAQS 2023 (Costa Rica) is planned, through an special session led by Pierre Lacan (pendent of approval, <http://iaspei.org/commissions/latin-american-and-caribbean-seismological-commission>)

7. Financial statement (\$ USD only): Please indicate total funding received from UNESCO/IUGS since the start of the project (i.e. 2019: \$5k; 2020: \$0k; 2021: \$7k; 2022: \$10k)

2022: 10,000 USD

2023: 9,000 USD See document attached Form III for the details

9. What additional funding besides the IGCP seed funding has the project obtained due to the IGCP label?

Additional funding (total 18,056.48 USD) was obtained, thanks to the IGCP label from these three different sources:

- IKIAM university (Ecuador) **3000 USD** to cover the expenses of María Ortuño for the Short course on Active tectonics and invited lecture during the REDU 2023 meeting
- Mexic-France Project, budget 16.498,54 USD ECOS NORD México-Francia (CONACYT-ANUIES), led by P. Lacan and L. Audin (call 2021) supported the UGM 2023 IGCP 669 session (name of the project: Obtención de datos de paleosismología y su integración en el cálculo del peligro sísmico en el Cinturón Volcánico Trans-Mexicano) (amount used: **7.306,49 USD**: 3181,86 USD for travel fellowships + 4124,63 USD for meals)
- IGME (Spanish Geological Survey), SGC (Colombian Geological Survey) and SGC (Geological Society of Colombia) co-sponsored the Training School in Bogotá with **5000 USD** to cover the travel and stay of 4 of the instructors (IGME), **2350 USD** to pay staff and the rent of the conference room (SGC) and **400 USD** to cover the afternoon coffee break (SGC)

10. Did all project leaders and participants inform their respective IGCP/IUGS National Committees?

We were in touch with the Spanish, Mexican, Colombian and French representatives. We will ensure to contact other committees during the next year, especially those in the countries where we are planning to be active (Argentina, Chile, Perú and Costa Rica).

11. Attach any information you may consider relevant

Attachments (check the box if document is attached or included)

Financial statement-Form III

X

Meeting report(s)-Form IV

X

Publications

X

Documents of the Annual meeting Announcement, Updates

X