

Transfrontier Collaboration in Seismology Lessons from Brazil



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The EPOS SP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 871121 📑

Outline

- PASSCAL Experiments
 - CHARGE, BANJO-SEDA, BOLIVAR, BLSP (NSF)
 - Three-basin project (FAPESP)
- Parnaíba Basin Analysis Project (BP)
 - The multi-institutional/multi-disciplinary effort
 - Lessons learned
- Continent-to-Ocean (CAPES-COFECUB)
 - Details of the mobility program
 - Lessons learned
- Identifying Challenges



PASSCAL Experiments

Across-border collaboration in South America has been through PASSCAL deployments.





CHile-ARgentina Geophysical Experiment Study the structure of the South-Central Andes where a major change in slab geometry occurs



- Funded by NSF
- U Arizona, INPRES, UNSJ, U Chile





Broadband ANdean JOint Experiment Seismic Exploration of the Deep Altiplano

Study the structure of the Central Andes, with focus in the high Altiplano plateau.





https://www.geo.arizona.edu/sites/www.geo.arizona.edu/files/web/Beck/banjo/index.html

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Broadband Ocean-Land Investigations of Venezuela and the Antille arc Region Study island arc accretion processes occurring

in the northern margin of South America.





https://earthscience.rice.edu/research/groups/levandercarma/bolivar/

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Brazilian Lithosphere Seismic Project

Study the lithospheric structure of the Brazilian shield and its tectonic implications.



- Funded by NSF/FAPESP
- Carnegie Inst. Washing., ETH, USP



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Three-Basin Project

Investigate the evolution and geodynamics of the Paraná, Chaco and Pantanal basins.



- Funded by FAPESP
- USP, INPE, UFMS, UnB, IPT, Unipampa, UNESP, UFRN
- Obs San Calixto, UNP, INPRESS, Univ. La Plata, Univ Uruguay
- CSIC, Liverpool, NWU, Royal Holloway



http://moho.iag.usp.br/about/projects/PCPB/

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Parnaiba Basin Analysis Project

Improve our understanding on the origin and evolution of the Parnaíba cratonic basin.





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The Passive-Source Deployment A linear array of broadband and short-period stations was deployed collaboratively.

Broadband Stations

Parnaiba Basin

Geological Age

Precambrian





- 3 BB (U Cambridge)
- 8 BB (UFRN)10 SP (PEGBR)
- Timeline (2016-18)
- 2 year (acquisition)
- 1 year (analysis)
 Personnel
- 1 Faculty
- 1 PhD, 1 MSc, 1 IC



Fully funded by BP Energy do Brasil

The project contemplated a relatively big budget to cover all expenses:

Equipment

- Field vehicle
- Seismic equipment
- Processing/field computers

Travel

- Installation/service trips
- Conferences/workshops
- Student exchange
- Scholarships
- PhD student (x1)





Lessons learned

Differences in bureaucracy and UFRN's legal status posed challenges for collaboration.

Imports and visas

- Temporary importation was ok, but ...
- Difficulty returning imported equipment to UK
- Visa application challenging

PhD student

- Need for careful planning with international partners
- Generous scholarship not fully working

Other issues

- Repair of (imported) equipment after fieldwork
- PEGBR equipment ok.



Continent-to-Ocean

Strengthen and build partnerships between institutions in France and Brazil through the study of the ocean-continent transition.

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Work and Study Missions

The project started in 2019 and contemplated work/study missions for a period of 4 years:

Work missions

- 8 missions (BR-FR)
- 8 missions (FR-BR)
- 21 days max.

Study missions

- 6 missions (PhD x 6 mon)
- 2 missions (Postdoc x 1 yr)
- No missions FR-BR

COVID19

Project extended for 1 yr





Budget for consumables & services

The project also contemplated a small budget (R\$10.000/year) for ancillary expenses.

Consumables

- Spare parts for equipment
- Equipment maintenance
- Conference registration

Services

- Maintenance services
- Other services



Lessons learned

Obtaining the 'cash' is not the issue. Using it is.

Work missions

- CAPES only paid a maximum of 15 days (2019)
- COFECUB returned the 'favor' (2021)
- Maximum of \$2000,00 for plane tickets (@R\$3,40)

Study missions

- Long time for visa processing (postdoctoral mission)
- COVID19 restrictions made study missions not viable

Consumables

- Purchase of parts (internal HDs) was denied
- Repair/maintenance of computers was denied
- Registration to conferences for PI only



Identifying challenges

- Making collaboration run smoothly among partners at varying bureaucratic 'speeds:
 - Accept administrative differences
 - Develop patience and understanding
- Dealing with import/export and visa issues:
 - Adapt to delays related to import/export of goods
 - Show willingness to comply with visa restrictions
- Learning to 'expect the unexpected':
 - Accept that rules can change during the game
 - Improvise, adapt, overcome
- Building trust among partners