



José Alejandro González Alfaro

Education:

- College:

PhD in Earth Sciences, University of Chile, Santiago, Chile, 2021. Advisor Dr. Gabriel Easton. Thesis entitled: LATE QUATERNARY EVOLUTION OF LARGE COASTAL GEOMORPHOLOGICAL FEATURES CONTROLLED BY ACTIVE TECTONICS AT THE CONTINENTAL MARGIN OF NORTHERN CHILE.

Geologist, Catholic University of the North, Antofagasta, Chile, 2013.

BSc in Geological Sciences, Catholic University of the North, Antofagasta, Chile, 2011.

- Post-graduate diploma:

Hydrogeology Applied in Mining and Environment, University of Chile, Santiago, Chile, 2023.

- High School:

Seminario Conciliar High School, La Serena, Chile, 2001.

Research interests and skills:

- Active tectonics, tectonic geomorphology, structural geology, earthquake geology, paleoseismology, and marine geology. Applied methods: seismic reflection, differential GPS, fault cartography, and radiocarbon dating. My research is related to upper crustal deformation (uplift and subsidence), active faults, and geomorphological features located in coastal and continental shelf environments of subduction margins.

Academic work experience:

- University lecturer:

During the first semester of 2023-present, I have been teaching the course Introduction to Physical Geography for the Natural Resources Engineering career at the Faculty of Agronomy, Catholic University of Chile (PUC), Santiago, Chile.

During the second semester of 2022, I taught the course Stratigraphy for the Geology career at the Mathematic and Physic Sciences Faculty, University of Chile, Santiago, Chile.

During the second semester of 2022, I taught the course of Structural Geology for the Geology career at the Mayor University, Providencia, Chile.

From 2019 to the present, I taught the subjects of Geology and Quaternary Geomorphology for the Geography career at the Architecture and Urbanism Faculty, University of Chile, Santiago, Chile.

During 2021, I taught the subjects Geology Fieldwork 2 and Structural Geology at the Central University of Chile, Santiago, Chile.

▪ Teaching Assistant:

From 2013 to 2020, I worked as teaching assistant for the next subjects: Geology Fieldwork 1, Geology Fieldwork 2, General Geology and Geomorphology for the career of Geology at the Mathematic and Physic Sciences Faculty, University of Chile, Santiago, Chile

During 2017-2018, I worked as teaching assistant for the subject Experimental Sciences for the Classroom for the postgraduate program dictated by the Escuela de Verano (EdV), Mathematic and Physic Sciences Faculty, University of Chile, Santiago, Chile.

From 2014 to 2018, I worked as teaching assistant for the subjects of Geology I and Geology II. Dictated by the Escuela de Verano (EdV) for primary and high school students. Mathematic and Physic Sciences Faculty, University of Chile, Santiago, Chile.

From 2008 to 2011, I worked as teaching assistant for the next subjects: Mineral Ore Deposits 1, Mineral Ore Deposits 2, Fundamentals of Geology, Applied Geology, Fieldwork 1, Fieldwork 2, Geomorphology, Mining Geology 1, Mining Geology 2, and Geology of Chile for the career of Geology at the Catholic University of the North, Antofagasta, Chile.

**Scientific
papers
(published):**

- Salazar, D., Easton, G., Goff, J., Guedon, J. L., **González-Alfaro, J.**, Andrade, P., Villagrán, X., Fuentes, M., León, T., Abad, M., Izquierdo, T., Power, X., Sitzia, L., Álvarez, G., Villalobos, A., Olguín, L., Yrarrazabal, S., González, G., Flores, C., Borie, C., Campos, J. 2022. Did a 3800-year-old $M_w \sim 9.5$ earthquake trigger major social disruption in the Atacama Desert? *Science Advances* 8 (14). doi: 10.1126/sciadv.abm2996.
- Easton, G., **González-Alfaro, J.**, Villalobos, A., Álvarez, G., Melgar, D., Ruiz, S., Sepúlveda, B., Escobar, M., León, T., Báez, J.-C., Izquierdo, T., Forch, M., Abad, M. 2022. Complex Rupture of the 2015 $M_w 8.3$ Illapel Earthquake and Prehistoric Events in the Central Chile Tsunami Gap. *Seismological Research Letters* 93 (3), 1479–1496. <https://doi.org/10.1785/0220210283>.
- Easton, G., Lira, N., León, T., **González-Alfaro, J.**, Salazar, D. 2021. La evolución de la línea de costa como guía para la prospección de potenciales sitios arqueológicos arcaicos en la plataforma submarina del desierto de Atacama. *Boletín de la Sociedad Chilena de Arqueología*, 24.
- **González-Alfaro, J.**, Vargas, G., Ortlieb, L., González, G., Ruiz, S., Baez, J.-C., Madeng-Yogo, M., Caquineau, S., Álvarez, G., Del Campo, F., Del Río, I. 2018. Abrupt increase in the coastal uplift and earthquake rate since ~40 ka at the northern Chile seismic gap in the Central Andes. *Earth and Planetary Science Letters* 502, 32–45. doi: 10.1016/j.epsl.2018.08.043.
- Fuentes, M., Riquelme, S., Hayes, G., Medina, M., Melgar, D., Vargas, G., Villalobos, A., **González, J.** 2016. A Study of the 2015 $M_w 8.3$ Illapel Earthquake and Tsunami: Numerical and Analytical Approaches. *Pure and Applied Geophysics* 173 (6), 1847–1858. doi: 10.1007/s00024-016-1305-0.

Conference papers:

- **González-Alfaro, J.**, Potin B., Ruiz, S., Pastén-Araya, F., Easton, G. 2023. Unraveling the microseismic activity of the Puerto Aldea Fault, Coquimbo Region: Seismic hazard assessment along coastal La Serena-Tongoy. XVI Congreso Geológico Chileno, Santiago, Chile
- **González-Alfaro, J.**, Easton, G., González. G., Bonvalot, S., Gabalda, G., Álvarez, G., Ruiz, S. 2023. Architecture, upper crustal extension, and collapse of a continental shelf raised at an accelerated rate during the Quaternary, northern Chile.
- Pastén-Araya, F., Guiñez, F., **González-Alfaro, J.**, Ruiz, S., Potin, B. 2022. Posible sismicidad en la corteza continental asociada a la falla Puerto Aldea, región de Coquimbo. Grupo Interdisciplinario de Amenaza Sísmica, Santiago, Chile.
- **González-Alfaro, J.**, Vargas, G., González, G., Álvarez, G. 2018. Evolución cuaternaria tardía de grandes rasgos geomorfológicos costeros condicionados por la acción de fallas corticales y terremotos de subducción en el norte de Chile. XV Congreso Geológico Chileno, Concepción, Chile.
- **González-Alfaro, J.**, Martin, C. 2018. La Península de Mejillones: historia, biodiversidad y su potencial como Geoparque. XV Congreso Geológico Chileno, Concepción, Chile.
- Peña, M., **González-Alfaro, J.**, Gómez, I., Poblete, F., Roperch, P. 2018. El sistema de falla coloso: efectos de un lineamiento NW en la deformación de la cordillera de la costa y la península de mejillones. XV Congreso Geológico Chileno, Concepción, Chile.
- **González-Alfaro, J.**, Vargas, G., González, G., Bonvalot, S., Gabalda, G., Álvarez, G., Leyton, F., Huerta, B., Valdenegro, J. 2017. Paleoseismology and Late Quaternary upper crustal deformation along active submarine faults on the continental shelf at 23°S, northern Chile. 8th International INQUA Meeting on Paleoseismology, Active Tectonics and Archeoseismology (PATA), Blenheim, New Zealand.
- **González-Alfaro, J.**, Vargas, G., Ortlieb, L., González, G., Ortlieb, L. 2016. Accelerated upper crustal uplift since MIS 3 at the southern edge of the northern Chile megathrust seismic gap. 7th International INQUA Meeting on Paleoseismology, Active Tectonics and Archeoseismology (PATA), Crestone, Colorado, USA.
- **González-Alfaro, J.**, Vargas, G., Ortlieb, L., González, G., Bonvalot, S., Gabalda, G., Álvarez, G., Huerta, B., Valdenegro, J. 2015. Evidencias del MIS 3 en la Península de Mejillones y su implicancia dentro de un contexto geomorfológico, estructural y de grandes terremotos de subducción. XIV Congreso Geológico Chileno, La Serena, Chile.
- Grijalba, V., González, F., Vargas, G., **González, J.** 2015. Granulometría y facies de los sedimentos del aluvión de Chañaral, marzo 2015. XIV Congreso Geológico Chileno, La Serena, Chile.
- **González, J.**, Vargas, G., Ortlieb, L., González, G., Bonvalot, S., Gabalda, G., Álvarez, G. 2014. Late Quaternary accelerated coastal uplift and crustal faulting in Mejillones peninsula at the southern edge of the Northern Chile subduction seismic gap. American Geophysical Union (AGU), Fall Meeting, San Francisco, USA.
- **González, J.**, González, G., Vargas, G. 2012. Cartografía de Fallas Submarinas Activas en la Península de Mejillones. XIII Congreso Geológico Chileno, Antofagasta, Chile.

- **González, J.,** González, G., Vargas, G. 2009. Antecedentes Preliminares de Reconocimiento de Fallas Submarinas en la Península de Mejillones, 22° 45'–23° 05' S. XII Congreso Geológico Chileno, Santiago, Chile.
- Seminar: Geometric Modeling of Structural Styles present in Deformed Belts. Instructor: Dr. Fernando Martínez (Catholic University of the North, Antofagasta, Chile), Universidad de Chile, Santiago, Chile, 2019.

Research projects:

- Principal investigator of the Postdoctoral FONDECYT project #3240553, entitled “DESCIFRANDO LA MICROSISMICIDAD RECIENTE DE LA FALLA PUERTO ALDEA, REGIÓN DE COQUIMBO: EVALUACIÓN DEL PELIGRO SÍSMICO A LO LARGO DEL SECTOR COSTERO DE LA SERENA-TONGOY”, from 2023 to 2027, Department of Geophysics, FCFM, University of Chile, Santiago, Chile.

Participation in research projects:

- Researcher geologist for the FONDECYT project #1201387, 2020–2023, entitled “UNVEILLING MULTIMILLENNIAL CYCLES AND SUPER-CYCLES OF TSUNAMIGENIC MEGATHRUST EARTHQUAKES IN THE MAJOR NORTHERN CHILE SEISMIC GAP”. Researcher in charge: Dr. Gabriel Easton, FCFM, University of Chile, Santiago, Chile.
- Technical assistant for the FONDECYT project #1190734, 2019–2021, entitled “¿PLANIFICACIÓN URBANA EN RIESGO? PRÁCTICAS SOCIO-ESPACIALES DE COMUNIDADES EN EL PIEDEMONTES DE SANTIAGO, CHILE, Y SU INCIDENCIA EN LA FALLA SAN RAMÓN (FSR) COMO NUEVO ESCENARIO DE RIESGO SÍSMICO Y SOSTENIBILIDAD”. Researcher in charge: Dr. Jorge Inzulza, Faculty of Architecture and Urbanism, University of Chile, Santiago, Chile.
- Technical assistant for the FONDECYT project #1161547, 2016–2019, entitled “ASSESSING GIANT TSUNAMIGENIC EARTHQUAKES ALONG THE HYPERARID NORTHERN CHILE SEISMIC GAP IN THE LAST MILLENNIA”. Researcher in charge: Dr. Gabriel Easton, FCFM, University of Chile, Santiago, Chile.
- Technical assistant for the FONDECYT project #1151203, 2015–2018, entitled “TRAYECTORIA HISTÓRICA, CAMBIOS AMBIENTALES Y EVENTOS CATASTRÓFICOS DURANTE EL PERÍODO ARCAICO EN LA COSTA DE TALTAL, NORTE DE CHILE”. Researcher in charge: Dr. Diego Salazar, Faculty of Social Sciences, University of Chile, Santiago, Chile.
- Technical assistant for the FONDECYT project #1140846, 2016–2019, entitled “QUATERNARY UPPER PLATE DEFORMATION IN THE MEJILLONES PENINSULA, NORTHERN CHILE: UNDERSTANDING PLATE INTERACTION AT SEGMENT BOUNDARIES OF SUBDUCTION ZONES”. Researcher in charge: Dr. Gabriel González, Faculty of Engineering and Geological Sciences, Catholic University of the North, Antofagasta, Chile.
- Technical assistant for the FONDECYT project #1110196, 2014–2017, entitled “CAZADORES-RECOLECTORES, PESCADORES Y MINEROS DEL PERIODO ARCAICO EN LA COSTA DE TALTAL, NORTE DE CHILE”. Researcher in charge: Dr. Diego Salazar, Faculty of Social Sciences, University of Chile, Santiago, Chile.
- Undergraduate thesis student for the FONDECYT project #1085117, 2008–2011, entitled “THE PALEOSEISMOLOGICAL SIGNIFICANCE AND EARTHQUAKE PROBABILITY OF INTRA-PLATE FAULTING AT ACTIVE

CONTINENTAL MARGINS: STUDY CASES OF NORTHERN CHILE".
Researcher in charge: Dr. Gabriel González, Faculty of Engineering and Geological Sciences, Catholic University of the North, Antofagasta, Chile.

**Professional
work
experience:**

- Professional support. Advice consultant provided to Colbún Energy Company during the months of April-June 2018, San Pedro river, Región de Los Ríos, Chile.
The work consisted of a field survey to recognize potential active faults near to the hydroelectric dam foundations located in the San Pedro river.
This work was endorsed by the geologists Dr. Gabriel Easton and MSc. Sofía Rebolledo (University of Chile).
- Professional support. Advice consultant provided to Energía Austral, Energy Company, during March-July 2015, Región de Aysén, Chile.
The work consisted of the compilation of bibliographic and cartographic information to assess the presence of potential quaternary faults on the fjords seabed located in the Región de Aysén.
This work was endorsed by the geologist Dr. Gabriel Easton (University of Chile).
- Professional support. Advice consultant during the months of January-February 2014, Puerto Aysén, Chile. Requested by Energía Austral Energy Company.
The work consisted of drilling sites determined by the company to assess possible eruptive events of nearby volcanic complexes. In addition, seismic reflection profiles were performed at Lake Los Tabos to assess the presence of potential active faults.
This work was endorsed by the geologist Dr. Gabriel Easton (University of Chile).
- Professional support for the FONDECYT#1110196 required by the anthropologist Dr. Diego Salazar during March 2012, Región de Antofagasta, Chile.
The work consisted of the geophysical data acquisition from the Taltal bay seabed and the subsequent preparation of a bathymetric map.
This work was endorsed by the geologist Dr. Gabriel Easton (University of Chile).
- Professional support during the months of June-July 2012. The work consisted of describing the basic geology, and identifying potential active faults near the dump of Punta Paragua Ash Landfill, Tocopilla, Región de Antofagasta, Chile. Required by ECL-SUEZ Energy Company.
This work was endorsed by the geographer Dr. Jorge Ramírez (University of Antofagasta).
- Professional support during the months of January-February 2011. The work consisted of describing the basic geology and identifying different geotechnical units along coastal northern Chile: Región de Arica y Parinacota, Región de Tarapacá, and Región de Antofagasta. Required by ECL-SUEZ Energy Company.
This work was endorsed by the geologist Dr. Gabriel González (Catholic University of the Norte- CIGIDEN).

**Completed
advanced
courses and
seminars:**

- Course: INQUA Summer School on Active Faults and Volcano-Tectonics. Instructor: Luigi Ferranti and Francesco Iezzi. University of Naples “Federico II”, Naples, Italy, 2023.
- Course: Quaternary Geochronology. Instructor: Dr. José Luis Antinao (Indiana University, Indiana, USA), Universidad de Chile, Santiago, 2019.
- Course: Computer Tools for Geomorphological and Seismotectonic Analysis. Instructor: Dr. Jean Baptiste Ammirati, University of Chile, Santiago, 2018-2019.
- Course: Modeling Lithospheric Deformations in Active Margins and Continental Collision Zones. Instructor: Dr. Joseph Martinod (Université de Savoie, France), University of Chile, Santiago, Chile, 2018.
- Course: Morphotectonic and Paleoseismology. Instructor: Dr. Carlos Costa, University of Buenos Aires, Buenos Aires, Argentina, 2016.
- Course: Advanced Structural Geology. Instructor: Dr. Richard Allmendinger (Cornell University, New York, USA), Catholic University of the North, Antofagasta, Chile, 2016.
- Seminar: Deform–Active Tectonics Workshop, Barcelonnette, France, 2015.
- Seminar: Paleoseismology of Active Faults: ten years of the San Ramón Fault and new perspectives for seismic hazard, University of Chile, Santiago, Chile, 2014.
- Course: Structural 3D Styles in Deform Ranges Analysis. Instructor: Dr. César Arriagada, University of Chile, Santiago, Chile, 2014.
- Course: Earthquakes in Chile. Instructor: Dr. Sergio Ruiz, University of Chile, Santiago, Chile, 2013.
- Course: Chilean Margin Geodynamics. Instructor: Dr. Eduardo Contreras, University of Chile, Santiago, Chile, 2013.
- Course: Geodynamic Processes in Subduction Environments. Instructors: Dr. Reynaldo Charrier and Dr. Marcelo Farías, University of Chile, Santiago, Chile, 2013.
- Seminar: Quaternary Geochronology. Instructor: Dr. Steven Forman (University of Illinois, Illinois, USA), University of Chile, Santiago, Chile, 2012.

**Scientific
diffusion:**

- Participation in the school scientific festival “Carnaval de las Ciencias del Mar 2022”, Iquique, Chile, August 2022.
- Explora CONICYT program “1000 Científicos 1000 Aulas”. Titled talks: “WHY 9 OF 10 NATURAL DISASTERS PREFER CHILE?” and “URBAN GEOLOGY: WHAT IS UNDER YOUR FEET?” Santiago, Chile, 2016–2017.

**Softwares
experience:**

- ArcGIS Pro: Geographic Information System (GIS); advanced user.
- QGIS: Geographic Information System (GIS); advanced user.
- Erdas 9.1: Geographic Information System (GIS); basic user.

- RiverTools: Drainage systems analyses; average user.
- Groundwater Vistas: Hydrogeology numerical modelling; average user.
- Phreeqc: Geochemical software specializing in speciation, batch-reaction, one-dimensional transport, and inverse geochemical calculations; basic user.
- Illustrator, Corel Draw, Photoshop: Image treatments and processing; advanced user.
- Faulkin, MohrPotter and Stereonet: Structural Geology analyses; advanced user.
- SonarWiz 5: Seismic profiles treatments and processing; average user.
- TerraceM: Marine terraces analyses, landscape evolution; advanced user.
- Trimble Bussines Center: GPS data processing; average user.
- Matlab: mathematical and graphical analyses; average user.
- Linux-GMT: Geographic Information System (GIS); basic user.
- Move 2013 (Midley Valley); Geological structural modelling; basic user.
- Microsof Offices: Document redaction, presentations, worksheets, databases, charts, graphs, digital paintings and digital videos; advanced user.

**Grants and
scholarships
awarded:**

- National Doctoral Scholarship, CONICYT (ANID), Santiago, Chile, 2015–2017.
- Accommodation and Feeding Scholarship, Catholic University of the North, Antofagasta, Chile, 2004–2010.

**Extra-
program
activities:**

- President of the Hogar de Varones Rubén Bustos Lynch, Universidad Católica del Norte, Antofagasta, Chile, 2009–2010.
- Actor for the Theater Company of the Catholic University of the North, Antofagasta, Chile, 2004–2005.

**Hobbies and
interests:**

- Sport interests: Mountain treekin, once per month; running practice, three times per week (12 km).
- Musical interest: Violinist (amateur).