

Mara Anabel Figueroa Berroca

Jet Propulsion Laboratory – Earth Science Section

4800 Oak Grove Drive, Mail Stop 238-600 - Pasadena, CA 91109

E-mail: mara.figueroa.berroca@jpl.nasa.gov; marafibe@gmail.com

Phone: (614) 302-8270

Education

- **Ph.D. in Geodetic Science** (Aug. 2020 – Jan. 2025)
School of Earth Sciences, The Ohio State University, United States of America.
Dissertation: Modeling Co- and Postseismic Deformation of the Mw 8.3 Illapel and Mw 8.8 Maule Earthquakes: Insights for Geodetic Applications and Andean Seismotectonics.
Advisor: Dr. Demián D. Gómez. **GPA: 4.00/4.00**
- **Master's Degree in Geographic Information Technologies: GIS and Remote Sensing** (Sep. 2016 – Jul. 2017)
School of Philosophy, Humanities and Literature, University of Extremadura, Spain.
Thesis: Mortality Atlas of the Autonomous Community of Extremadura.
Advisor: Dr. José A. Gutiérrez. **GPA: 9.85/10**
- **Surveying Engineering** (Mar. 2010 – Sep. 2015)
School of Engineering, National University of San Juan, Argentina.
Thesis: The GIS Geotechnology in the Administration of a Multipurpose Municipal Cadaster.
Advisor: Prof. Eduardo Márquez. **GPA: 9.43/10**
- **Technical Degree in Construction** (Mar. 2003 – Mar. 2010)
Industrial School, National University of San Juan, Argentina.
GPA: 8.83/10

Professional Experience

- **Postdoctoral Researcher** (May 2025 – Present)
Jet Propulsion Laboratory, California Institute of Technology, NASA, United States of America.
Solid Earth and Ice Group, Earth Sciences, Engineering & Science Directorate
Tasks: To develop coseismic and postseismic deformation models for integration into GeoFIND, a global tool for predicting the positions of passive geodetic benchmarks. Project funded by the U.S. National Geospatial-Intelligence Agency (NGA).
- **Postdoctoral Researcher** (Jan. 2025 – May 2025)
Geodetic Science Division, School of Earth Sciences, The Ohio State University, United States of America.
Tasks: To develop the coseismic deformation model of the 2010, Maule, Chile earthquake. Project funded by the National Geodetic Survey (NGS).

- **Graduate Research Assistant** (Aug. 2021 – Aug. 2023, Aug. 2024 – Dec. 2024)
Geodetic Science Division, School of Earth Sciences, The Ohio State University, United States of America.
Tasks: To assist with research projects led by Dr. Demian Gómez and to mentor graduate and undergraduate students.
- **Lead Surveying Engineer** (Nov. 2019 – Aug. 2020)
DAMS S.R.L., Argentina.
Tasks: To perform all surveying and measurement activities, and to process and deliver products and reports including topographic surveys, drone-based mapping, digital elevation models, and remote sensing analyses for diverse engineering projects.
- **Surveying Engineer** (Nov. 2017 – Mar. 2018)
DATUM S.A., Veladero gold mine in San Juan, Argentina.
Tasks: To audit all topographic and surveying work performed by consultant companies for the Construction Sector of Barrick Gold Corporation, including the lixiviation valley. This included field measurements, data processing, and quality control to ensure accuracy and compliance with project specifications.
- **Assistant Professor** (Mar. 2016 – Aug. 2016, Dec. 2018 – Aug. 2020)
School of Engineering, National University of San Juan, Argentina.
Classes: Technical Drawing and Representation Systems, Computer-aided Technical Drawing and Design (AutoCAD), and Calculus I.
- **Assistant, Project Control Section** (May 2015 – Mar. 2016)
SEMISA S.R.L., Veladero gold mine in San Juan, Argentina.
Tasks: To prepare and manage Gantt charts for all construction projects in the Construction Sector of Barrick Gold Corporation, monitor progress, adjust schedules as needed, track worker hours for payroll audits, and audit machinery and vehicle usage for accurate billing and compliance.
- **Teaching Assistant** (Jun. 2011 – May 2015)
School of Engineering, National University of San Juan, Argentina.
Classes: Technical Drawing and Representation Systems and Computer-aided Technical Drawing and Design (AutoCAD).

Publications Under Review or Ready for Submission

- **Figueroa, M. A.**, Gómez, D. D., Bevis, M. G., Smalley, R., Folguera, A., Spagnotto, S., Griffith, W. A., Kellmayer, B., Caccamise, D., Kendrick, E., Smith, P. Comprehensive orogenic-wedge dynamics of the South-Central Andes revealed by the 2010 Maule earthquake. Submitted to *Nature Communications*.
- Chong-You W., Gómez, D. D., **Figueroa, M. A.** CoInSAR: A robust approach to integrate InSAR and GNSS displacements by Least Squares Collocation. Ready for submission to *Journal of Geodesy*.
- Sobrero, F., Wang, F., Bevis, M.G., Gómez, D. D., **Figueroa, M. A.**, Blewitt, G. On the characteristic timescales of bilogarithmic transient models for postseismic displacements following the 2011 Tohoku-Oki earthquake. Ready for submission to *Geophysical Journal International*.

Peer-reviewed Publications

- **Figueroa, M. A.**, Sobrero, F. S., Gómez, D. D., Smalley, R., Jr., Bevis, M. G., Griffith, W. A., Caccamise, D., Kendrick, E. (2024). Creep on the Argentine Precordillera décollement following the 2015 Illapel, Chile, earthquake: Implications for Andean seismotectonics. *Geophysical Research Letters*, 51, 19. <https://doi.org/10.1029/2024GL110945>
- Gómez, D. D., **Figueroa, M. A.**, Sobrero, F., Smalley, R., Bevis, M. G., Caccamise, D., Kendrick, E. (2023). On the determination of coseismic deformation models to improve access to geodetic reference frame conventional epochs in low density GNSS networks. *Journal of Geodesy*. 97, 46. <https://doi.org/10.1007/s00190-023-01734-0>
- Leiva, F., Ruiz, F., Acosta, G., Nacif, S., Spagnotto, S., Nacif, A., Christiansen, R., Sisterna, J., **Figueroa, M. A.** (2018) Geodetic changes associated with crustal deformation on the Andean backarc of San Juan, Argentina. *Pure and Applied Geophysics*. 176, 611–625. <https://doi.org/10.1007/s00024-018-2031-6>

Non Peer-reviewed Publications

- Gregori, D., Ruiz, F., Leiva, F., Christiansen, R., Alvarez, O., **Figueroa, M. A.**, Acosta, G., Guillen, S. (2021) ¿Por qué suceden los simos en San Juan? Book. ISBN: 9789506058944.
- **Figueroa, M. A.**, Gutiérrez, J. A., Quirós, E. M. (2019) Atlas de mortalidad de la Comunidad Autónoma de Extremadura. Book chapter in book *Sistemas de Información Geográfica y Teledetección: Aplicaciones en el Análisis Territorial*. ISBN: 9788409037490.
- **Figueroa, M. A.**, Gutiérrez, J. A., Quirós, E. M. (2018) Atlas de mortalidad de la Comunidad Autónoma de Extremadura. Book. ISBN: 9788409118373.

Invited Talks, Seminars and Courses

- **Seminar titled “Geodynamics. Extended Trajectory Models and Trajectory Prediction Models”** (Jun. 2025) Geodetic Reference System for the Americas (SIRGAS) Virtual School on “Terrestrial Reference Frame. Geodynamic and Atmospheric Monitoring 2025.”
- **Seminar titled “Deformation Models. Coseismic Deformation”** (Jun. 2025) Geodetic Reference System for the Americas (SIRGAS) Virtual School on “Terrestrial Reference Frame. Geodynamic and Atmospheric Monitoring 2025.”
- **5-day course on “Non-linear Deformation Models Using GNSS Data”** (Oct. 2024) School of Topography, Cadaster, and Geodesy, National University of Costa Rica, Costa Rica.
- **Invited talk titled “Trajectory Prediction Models”** (Nov. 2022) Engineering School, National University of San Juan, Argentina.

Conferences and Workshops

- **Figueroa, M. A.**, Gómez, D. D., Bevis, M. G., Folguera, A., Griffith, W. A., Smalley, R., Spagnotto, S., Kellmayer, B., Smith, P., Caccamise, D., Kendrick, E. (2025) *Creep on the Precordillera-Agrio Décollement During the 2010 Maule, Chile, Earthquake*. Poster. AGU Fall Meeting 2025.

- Smalley, R., **Figueroa, M. A.**, Gómez, D. D., Bevis, M. G., Kendrick, E. (2025) *The Earthquake Cycle on the Nazca–South America Subduction Margin from the Pacific to the Atlantic: insights from the Central Andes GPS Project*. Oral presentation. AGU Fall Meeting 2025.
- **Figueroa, M. A.**, Gómez, D. D., Bevis, M. G., Caccamise, D., Griffith, W. A., Heck, J. H., Smalley, R. Jr. (2024) *An empirical formulation to determine an earthquake’s area of influence for GNSS trajectory modeling*. Oral presentation. SIRGAS Symposium 2024 in Bogotá, Colombia.
- **Figueroa, M. A.**, Sobrero, F. S., Gomez, D. D., Smalley, R., Bevis, M. G., Caccamise, D., Kendrick, E. (2024). *Microplate behaviour of the Andes during co- and early postseismic phases of the seismic cycle*. Poster. EGU 2024 General Assembly in Vienna, Austria.
- **Figueroa, M. A.**, Sobrero, F. S., Gomez, D. D., Smalley, R., Bevis, M. G., Caccamise, D., Kendrick, E. (2023). *VEL-Ar 2.0: The updated trajectory prediction model for Argentina*. Poster. IUGG 2023 General Assembly in Berlin, Germany.
- **Figueroa, M. A.**, Gomez, D. D., Sobrero, F. S., Smalley, R., Bevis, M. G., Caccamise, D., Kendrick, E. (2022). *Modelos cinemáticos de deformación*. Oral presentation. FIG technical seminar: Reference Frames in practice seminar and IGS training in Santiago de Chile, Chile.
- **Figueroa, M. A.**, Gomez, D. D., Sobrero, F. S., Smalley, R., Bevis, M. G., Caccamise, D., Kendrick, E. (2022). *Coseismic Deformation Models in Low Density GNSS Networks: A new methodology to provide access to reference frame conventional epochs*. Oral presentation. SIRGAS 2022 Symposium in Santiago de Chile, Chile.
- Sobrero, F. S., Gómez, D. D., **Figueroa, M. A.**, Caccamise, D. J., Álvarez, A., Mackern, M. V. (2022). *On the geodetic capacity assessment in the Americas*. Poster. SIRGAS Symposium 2022 in Santiago de Chile, Chile.
- **Figueroa, M. A.**, Gomez, D. D., Smalley, R., Bevis, M. G., Alvarado, P. M., Baigorri, H. (2019). *Developing Coseismic Deformation Models for Geodetic Applications*. Poster. AGU Fall Meeting 2019.
- **Figueroa, M. A.**, Gutiérrez, J. A., Quirós, E. M. (2019) *Geographic Information Systems in Space Epidemiology*. Oral presentation. III Binational Scientific Research Congress in San Juan, Argentina.

Scientific Journal Reviewer

- Scientific Reports – Springer Nature
- Journal of Geophysical Research - Solid Earth
- Earth and Space Science
- Revista Técnica de Ingeniería, Universidad del Zulia, Venezuela
- Revista Ingeniería de la Universidad de Costa Rica

Field Experience

- **ANET-POLENET Field Season in Antarctica** (Dec. 2023 – Jan. 2024)
Tasks: To install, service and maintain a total of 16 GNSS and seismic stations in Western Antarctica.
- **Re-measurement of Campaign GNSS Stations in San Juan, Argentina** (Jan. 2024 – Feb. 2024)

Tasks: To plan and lead a field campaign in San Juan, Argentina, to re-measure 18 GNSS sites without continuous monitoring part of the Central Andes GPS Project (CAP).

- **GNSS Campaign in Neuquén and San Juan, Argentina** (May 2022 – Jun. 2022)

Tasks: To plan and participate in a field campaign in Neuquén and San Juan, to re-measure GNSS sites without continuous monitoring part of the CAP network, and to install a permanent GNSS station (RSAU) for the Red Argentina de Monitoreo Satelital Continuo (RAMSAC).

- **While working for DAMS S.R.L** (Nov. 2019 – Aug. 2020)

Tasks: To plan, lead, and process topographic and drone-based photogrammetric surveys for agriculture, urban planning, and limestone and cement mines in San Juan, Argentina.

- **Geophysical Campaign in Jujuy, Argentina** (Jul. 2018)

Tasks: To conduct GNSS, relative gravity, and magnetometry surveys at a lithium mine in Jujuy, Argentina.

- **While working for DATUM S.R.L** (Nov. 2017 – Mar. 2018)

Tasks: To plan, conduct, and process topographic surveys of buildings, structures, and the lixiviation valley at the Veladero gold mine in San Juan, Argentina.

Awards and Honors

- **Kaarina and Weikko A. Heiskanen Junior Award** (2024)

Division of Geodetic Science, School of Earth Sciences, The Ohio State University.

- **Distinguished Senior Ph.D. Graduate Student - Spieker Book Award** (2023)

Division of Geodetic Science, School of Earth Sciences, The Ohio State University.

- **Outstanding Ph.D. Candidate - Michael Johnson Graduate Award** (2022)

Division of Geodetic Science, School of Earth Sciences, The Ohio State University.

- **Distinguished 1st Year Graduate Student in Geodetic Science - Estwing Award** (2021)

Division of Geodetic Science, School of Earth Sciences, The Ohio State University.

- **Distinguished University Fellowship** (2020 – 2021, 2023 – 2024)

The Ohio State University.

- **Erasmus Mundus Fellowship** (2016 – 2017)

The European Union.

- **Scholarship for Outstanding Undergraduate Students** (2013 – 2015)

Bank of San Juan, Argentina.

- **Bicentennial Scholarship for Scientific and Technical Fields** (2010 – 2015)

Ministry of Education, National Government of Argentina.

Service

- **Central Bureau Liaison of the International GNSS Service (IGS)** (2025 – Present)

Part of the Local Organising Committee and Scientific Organising Committee of the IGS 2026 Workshop in Chile. Representing the Jet Propulsion Laboratory.

- **National Geodetic Infrastructures Coordinator of Working Group II - Geodetic Reference System for the Americas (SIRGAS) (2020 – Present)**
Representing the United States of America.
- **Treasurer of the Society for Advancement of Chicanos and Native Americans in Science (SACNAS) OSU Chapter (2023 – 2024)**
The Ohio State University.
- **Graduate Student Representative of the Division of Geodetic Science (2021 – 2022)**
School of Earth Sciences, The Ohio State University.
- **Treasurer of the Association of Surveying Engineering Students (2014 – 2015)**
School of Engineering, National University of San Juan, Argentina.