

CURRICULUM VITAE**Name:** Laura E. G. Gallardo Klenner**Title:** Dr., Ph.D. Chemical Meteorology**Nationality:** Chilean**Date of birth:** Santiago de Chile, February 27 1962**Postal Address:** Casilla 170, Correo 3, Santiago, Chile**E-mail:** lgallard@u.uchile.cl**www:** <http://www.dgf.uchile.cl/LauraGallardo/>**Phone/Fax:** 56-2-29784566/ 56-2-6889705**Work:** Professor, Geophysics Department, University of Chile. First Director for the Center for Climate and Resilience Research (<http://www.cr2.cl/>), currently adjunct researcher under Resilient Cities. Also, director for postgraduate studies at University of Chile**SUMMARY**

Laura Gallardo is a Professor at the Geophysics Department (DGF), University of Chile. She acted as the first director for the Center of Excellence for Climate and Resilience Research (<http://www.cr2.cl/>). She got a PhD in Chemical Meteorology at Stockholm University (MISU) in 1996 working on lightning emissions of oxidized nitrogen under the guidance of Prof. Henning Rodhe. She returned to her home land Chile in 1997 where she worked as an expert advisor for National Commission for the Environment (now Ministry for the Environment) between 1997 and 2001, leading the first regional scale dispersion modeling studies in Chile, with emphasis on oxidized sulfur from copper smelting. In early 2002 she got a researcher position at the Center for Mathematical Modeling (CMM), where she begun studies on inverse modeling applications for constraining city-scale emission inventories, data assimilation and optimal network design. In December 2007, she got a permanent position at DGF. Her research papers are published in high impact journals. Her research interests are broad and cover atmospheric modeling and data assimilation, tropospheric ozone, air quality in mega cities, and lately short-lived climate forcers. She has been the leader for a scientific network and project studying South American Megacities (SAEMC, 2006-2012). She is the co-coordinator of the Prediction of Air Pollution in Latin America (PAPILA, 2018-2023), an international network funded by the European Union. She has served as a member of the Scientific Committee of the International Global Atmospheric of Chemistry (IGAC) for the period 2003-2009, and as a member of the international Commission for Atmospheric Chemistry and Global Pollution (iCACGP) since 2006. In 2010 she was elected as vice-president for iCACGP, and in 2015 she has was elected as vice-president for the International Association of Meteorology and Atmospheric Sciences (IAMAS). Also, she has served in the Scientific Steering Committee of the Surface Ocean Land Atmosphere Studies (SOLAS). She teaches courses on atmospheric chemistry, modeling and global change, inverse modeling, atmospheric science and introductory physics at University of Chile. She has guided multiple theses in engineering and atmospheric science in Chile. Roughly half of her students have followed research programs and scientific careers abroad. Two of her former students are now associate professors at her University, and one is an assistant professor at University of California, Los Angeles. All in all, she has made original scientific contributions, and played a significant role in establishing atmospheric chemistry and modeling in her home country and internationally. Dr. Gallardo (Research ID H-4370-2013) shows a vast international collaboration network, and her work is cited worldwide.

HIGHER EDUCATION

- B.Sc. Physics 1986, Department of Physics, Faculty of Physical and Mathematical Sciences, University of Chile
- M.Sc. Chemical Meteorology , 1993, Department of Meteorology, Stockholm University
- Ph.D. Chemical Meteorology, 1996, Department of Meteorology, Stockholm University

RESEARCH**Interests**

Atmospheric direct and inverse modeling at regional and global scales; Odd nitrogen and tropospheric ozone; Anthropogenic impacts on the climate system; Air quality and Megacities;; Short-lived climate forcers.

Active Grants

- Center for Climate and Resilience Research (CR)². Center of Excellence in Priority Areas (FONDAP 15110009, 2012-2017). Adjoint researcher under Resilient Cities.
- Prediction of Air Pollution in Latin America (PAPILA). Principal Investigator Guy Brasseur, Principal Investigator for Latin America, Laura Gallardo. Marie Skłodowska-Curie Research and Innovation Staff Exchange (H2020-MSCA-RISE-2017,777544, 2018-2023)
- Science-policy interfaces and scenario construction in Chile: how to better bridge scientific evidence and policy making? An inter-transdisciplinary challenge for environmental complex problems (FONDECYT 1230925, 2023-2025). Co-investigator.

Previous Grants

- Relación entre las condiciones atmosféricas y la presencia de SARS-CoV-2 en aerosol urbano de diferentes ciudades de Chile y su incidencia en mortalidad y letalidad de la enfermedad COVID-19 (ANID 383280)
- Propagation of polar stratospheric intrusions and its effect on the tropospheric chemical composition and moisture (ANID/DFG 371009)
- Implementación de un sistema móvil ultra sensible para la cuantificación en tiempo real de compuestos orgánicos volátiles con aplicación multidisciplinar en el territorio nacional (ANID/FONDEQUIP 347350)
- Transport of mineral dust in northern Chile and its deposition on the Andean Cryosphere (FONDECYT 1181139, 2018-2021). Co-Investigator.
- Black carbon mitigation for the updating of the Chilean Nationally Determined Contribution (NDC) to the Climate Agreement. Ministry for the Environment (2019). Principal Investigator.
- Dispersion modeling study of urban and rural black carbon in central Chile and its deposition to the Andean Cryosphere (FONDECYT 1150873, 2015-2018). Co-Investigator.
- Towards a first emission inventory in South America. Researcher, Principal Investigator Nicolás Huneus. Programa de cooperación internacional proyectos de apoyo a la formación de redes internacionales entre centros de investigación convocatoria 2016-2017 (CONICYT)
- “*Julietta en la tierra de las niñas*”. CONICYT outreach program (ED 190050). Deputy Director.

- Centro de Modelamiento Matemático de la Universidad de Chile. Programa de Financiamiento Basal (B0703 2007-2012). Participant.
- South American Emissions, Megacities, and Climate (SAEMC, 2006-2012, PI). IAI –Grant (Inter American Institute for Global Change Research). Scientific network involving 20 researchers in Argentina, Brazil, Colombia, Chile, Peru and the USA. Principal Investigator
- CLARIS (2003-2006). A Pilot Action on continental-scale air pollution produced by South American mega cities. 6th Framework program, European Union. Participant.
- ECOS Syd (2004-2006, Principal Investigator). Impacts of natural and anthropogenic aerosols on the stratocumulus deck off Chile. Laboratoire d’Optique Atmosphérique, CNRS/Université de Lille I, (LOA). Principal Investigator
- Diseño preliminar y evaluación de factibilidad para herramienta operacional de estimación de emisiones compatibles con calidad del aire. CODELCO División Teniente IM2 N° 46/04. Investigadora Responsable. 2004. Principal Investigator
- Urban Mobile Emissions in South American Mega cities (UMESAM). Interamerican Institute for Global Change (IAI). Investigadora Responsable. 2004. Principal Investigator
- Stratosphere-Troposphere Exchange processes and their impact on the ozone balance in the subtropics of the Southern Hemisphere: A multi-scale integrated study based at Cerro Tololo (30°S, 70°W, 2200 m a.s.l). CONICYT/FONDECYT 1030809. Investigadora Responsable (2003-2006). Principal Investigator
- Mejoría del conocimiento del recurso eólico en el norte y centro del país. Comisión Nacional de Energía (CNE). 2003. Participant.
- Application and development of inverse modeling techniques to air quality modeling and network design. CONICYT (Chile) /INRIA (Francia). Principal Investigator
- Implementación de un Modelo de Dispersión Gaussiano para el Reactor Nuclear La Reina y Análisis de Datos Meteorológicos Locales. Comisión Chilena de Energía Nuclear (CCHEN). 2002. Principal Investigator
- Influencia de fenómenos meteorológicos sobre la dispersión de contaminantes atmosféricos en la Región de Coquimbo (DIULS 020-2-03). Dirección de Investigación, Universidad de La Serena. 2002. Participant.
- Un sistema de información ambiental sobre contaminación atmosférica (1999-2-196). Ministerio Federal para la Investigación y la Tecnología – BMBF y CONICYT. 2000. Participant.
- The influence of meteorological phenomena on trace gas concentrations at Cerro Tololo (CHL 007/98ENV). German Federal Ministry for Research and Education, Universidad de La Serena. 1999-2000. Participant.
- Estudio sobre contaminación atmosférica en algunos sectores del Valle de Elqui (DIULS N° 220-2-07). Dirección de Investigación Universidad de La Serena. 1998-1999. Participant.
- “Aplicación de un modelo de escala regional a Chile central” (Área de trabajo 2) del programa de colaboración entre la Intendencia de Santiago en Chile y la Gobernación de Västra Götaland en Suecia “Fortalecimiento del Sistema de Información de Calidad del Aire”. Comisión Nacional del Medio Ambiente (CONAMA) y Gobernación de Västra Götaland en Suecia, Agencia de Cooperación Sueca para el Desarrollo (ASDI). 1998-2000. Principal Investigator.

PUBLICATIONS

Peer-reviewed journals (Research ID H-4370-2013) (2013-2023)

1. Seguel, R. J., Garreaud, R., Muñoz, R., Bozkurt, D., Gallardo, L., Opazo, C., Jorquera, H., Castillo, L., & Menares, C. (2023). Volatile organic compounds measured by proton transfer reaction mass spectrometry over the complex terrain of Quintero Bay, Central Chile. *Environmental Pollution*, 330, 121759. <https://doi.org/10.1016/j.envpol.2023.121759>
2. Zhang, D., Martin, R. v., Bindle, L., Li, C., Eastham, S. D., van Donkelaar, A., & Gallardo, L. (2023). Advances in Simulating the Global Spatial Heterogeneity of Air Quality and Source Sector Contributions: Insights into the Global South. *Environmental Science & Technology*, 57(17), 6955–6964. <https://doi.org/10.1021/acs.est.2c07253>
3. Daskalakis, N., Gallardo, L., Kanakidou, M., Nüß, J. R., Menares, C., Rondanelli, R., Thompson, A. M., & Vrekoussis, M. (2022). Impact of biomass burning and stratospheric intrusions in the remote South Pacific Ocean troposphere. *Atmospheric Chemistry and Physics*, 22(6), 4075–4099. <https://doi.org/10.5194/acp-22-4075-2022>
4. Osses, M., Rojas, N., Ibarra, C., Valdebenito, V., Laengle, I., Pantoja, N., Osses, D., Basoa, K., Tolvett, S., Huneus, N., Gallardo, L., & Gómez, B. (2022). High-resolution spatial-distribution maps of road transport exhaust emissions in Chile, 1990–2020. *Earth System Science Data*, 14(3), 1359–1376. <https://doi.org/10.5194/essd-14-1359-2022>
5. Seguel, R. J., Gallardo, L., Osses, M., Rojas, N. Y., Nogueira, T., Menares, C., de Fatima Andrade, M., Belalcázar, L. C., Carrasco, P., Eskes, H., Fleming, Z. L., Huneus, N., Ibarra-Espinosa, S., Landulfo, E., Leiva, M., Mangones, S. C., Morais, F. G., Moreira, G. A., Pantoja, N., ... Yoshida, A. C. (2022). Photochemical sensitivity to emissions and local meteorology in Bogotá, Santiago, and São Paulo. *Elementa: Science of the Anthropocene*, 10(1). <https://doi.org/10.1525/elementa.2021.00044>
6. Gayo, E. M., Muñoz, A. A., Maldonado, A., Lavergne, C., Francois, J. P., Rodríguez, D., Klock-Barría, K., Sheppard, P. R., Aguilera-Betti, I., Alonso-Hernández, C., Mena-Carrasco, M., Urquiza, A., & Gallardo, L. (2022). A Cross-Cutting Approach for Relating Anthropocene, Environmental Injustice and Sacrifice Zones. *Earth's Future*, 10(4). <https://doi.org/10.1029/2021EF002217>
7. Cazorla, M., Gallardo, L., & Jimenez, R. (2022). The complex Andes region needs improved efforts to face climate extremes. *Elementa: Science of the Anthropocene*, 10(1), 1–10. <https://doi.org/10.1525/elementa.2022.00092>
8. Morawska, L., Zhu, T., Liu, N., Torkmahalleh, M. A., Andrade, M. de F., Barratt, B., et al. (2021). The state of science on severe air pollution episodes: quantitative and qualitative analysis. *Environ. Int.* (Accepted)
9. Urquiza, A., Amigo, C., Billi, M., Calvo, R., Gallardo, L., Neira, C. I., et al. (2021). An Integrated Framework to Streamline Urban Resilience in the context of Climate Risk Assessment. *Earth's Futur.* doi:10.1029/2020EF001508.(In press)
10. Richard Toro, A., Catalán, F., Urdanivia, F. R., Rojas, J. P., Manzano, C. A., Seguel, R., et al. (2021). Air pollution and COVID-19 lockdown in a large South American city: Santiago Metropolitan Area, Chile. *Urban Clim.*, 100803. doi:10.1016/j.uclim.2021.100803.
11. Aldunce, P., Lillo, G., Araya, D., Maldonado, P., and Gallardo, L. (2021). Evaluating adaptation to drought in a changing climate: experience at the local scale in the Aconcagua Valley. *Clim. Dev.*, 1–12. doi:10.1080/17565529.2021.1893150.

12. Menares, C., Gallardo, L., Kanakidou, M., Seguel, R., and Huneus, N. (2020). Increasing trends (2001–2018) in photochemical activity and secondary aerosols in Santiago, Chile. *Tellus B Chem. Phys. Meteorol.* *72*, 1–18. doi:10.1080/16000889.2020.1821512.
13. Huneus, N., Denier van der Gon, H., Castesana, P., Menares, C., Granier, C., Granier, L., et al. (2020). Evaluation of anthropogenic air pollutant emission inventories for South America at national and city scale. *Atmos. Environ.* *235*, 117606. doi:10.1016/j.atmosenv.2020.117606.
14. Seguel, R. J., Gallardo, L., Fleming, Z. L., and Landeros, S. (2020). Two decades of ozone standard exceedances in Santiago de Chile. *Air Qual. Atmos. Heal.* *13*, 593–605. doi:10.1007/s11869-020-00822-w.
15. Bauer, C., Correa, C., Gallardo, L., González, G., Guridi, R., Latorre, C., Navarrete, S., Pommier, E., Rizzo, S., Saavedra, B., Simonetti, C., & Tironi, M. 2019. The Anthropocene in Chile. *Environ. Humanit.*, *11*(2), 467–476. <https://doi.org/10.1215/22011919-7754578>
16. Bozkurt, D., Rojas, M., Boisier, J. P., Rondanelli, R., Garreaud, R. D., & Gallardo, L. 2019. Dynamical downscaling over the complex terrain of southwest South America: Present climate conditions and added value analysis. *Clim. Dyn.* <https://doi.org/10.1007/s00382-019-04959-y>
17. Muñoz, A. A., Klock-Barría, K., Sheppard, P., Aguilera-Betti, I., Toledo, I., Christie, D., Gorena, T., Gallardo, L., González-Reyes, Á., Lara, A., Lambert, F., Gayo, E., Barraza, F., & Chávez, R. O. 2019. Multidecadal environmental pollution in a mega-industrial area in central Chile registered by tree-rings. *Sci. Total Environ.*, *696*, 133915. <https://doi.org/10.1016/j.scitotenv.2019.133915>
18. Gayo, E. M., McRostie, V. B., Campbell, R., Flores, C., Maldonado, A., Uribe-Rodriguez, M., Moreno, P. I., Santoro, C. M., Christie, D. A., Muñoz, A. A., & Gallardo, L. 2019. Geohistorical records of the Anthropocene in Chile. *Elem Sci Anth*, *7*(1), 15. <https://doi.org/10.1525/elementa.353>
19. Boisier, J. P., Alvarez-Garretón, C., Cordero, R. R., Damiani, A., Gallardo, L., Garreaud, R. D., Lambert, F., Ramallo, C., Rojas, M., & Rondanelli, R. 2018. Anthropogenic drying in central-southern Chile evidenced by long-term observations and climate model simulations. *Elementa*, *6*(1), 74. <https://doi.org/10.1525/elementa.328>
20. Arriagada, R., Aldunce, P., Blanco, G., Ibarra, C., Moraga, P., Nahuelhual, L., O’Ryan, R., Urquiza, A., & Gallardo, L. 2018. Climate change governance in the anthropocene: Emergence of polycentrism in Chile. *Elementa*, *6*(1), 68. <https://doi.org/10.1525/elementa.329>
21. Mazzeo, A., Huneus, N., Ordoñez, C., Orfanos-Cheuquela, A., Menut, L., Maillet, S., Valari, M., Denier van der Gon, H., Gallardo, L., Muñoz, R., Donoso, R., Galleguillos, M., Osses, M., & Tolvett, S. 2018. Impact of residential combustion and transport emissions on air pollution in Santiago during winter. *Atmos. Environ.*, *190*(June), 195–208. <https://doi.org/10.1016/j.atmosenv.2018.06.043>
22. Gallardo, L., Barraza, F., Ceballos, A., Galleguillos, M., Huneus, N., Lambert, F., Ibarra, C., Munizaga, M., O’Ryan, R., Osses, M., Tolvett, S., Urquiza, A., & Véliz, K. D. 2018. Evolution of air quality in Santiago: The role of mobility and lessons from the science-policy interface. *Elementa*, *6*(1), 38. <https://doi.org/10.1525/elementa.293>
23. Resquin, M. D., Santágata, D., Gallardo, L., Gómez, D., Rössler, C., & Dawidowski, L. 2018. Local and remote black carbon sources in the Metropolitan Area of Buenos Aires. *Atmos. Environ.*, *182*, 105–114. <https://doi.org/10.1016/j.atmosenv.2018.03.018>

24. Anet, G. J., Steinbacher, M., Gallardo, L., Velásquez Álvarez, A. P., Emmenegger, L., & Buchmann, B. 2017. Surface ozone in the Southern Hemisphere: 20 years of data from a site with a unique setting in El Tololo, Chile. *Atmos. Chem. Phys.*, **17**(10), 6477–6492. <https://doi.org/10.5194/acp-17-6477-2017>
25. Barraza, F., Lambert, F., Jorquera, H., Villalobos, A. M., & Gallardo, L. 2017. Temporal evolution of main ambient PM_{2.5} sources in Santiago, Chile, from 1998 to 2012. *Atmos. Chem. Phys.*, **17**(16), 10093–10107. <https://doi.org/10.5194/acp-17-10093-2017>
26. Gallardo, L., Henríquez, A., Thompson, A. M., Rondanelli, R., Carrasco, J., Orfanoz-Cheuquelaf, A., & Squez, P. V. 2016. The first twenty years (1994–2014) of ozone soundings from Rapa Nui (27°S, 109°W, 51m a.s.l.). *Tellus, Ser. B Chem. Phys. Meteorol.*, **68**(1), 29484. <https://doi.org/10.3402/tellusb.v68.29484>
27. Andrade-Flores, M., Rojas, N., Melamed, M. L., Mayol-Bracero, O. L., Grutter, M., Dawidowski, L., Antuña-Marrero, J. C., Rudamas, C., Gallardo, L., Mamani-Paco, R., De Fatima Andrade, M., & Huneus, N. 2016. Fostering a collaborative atmospheric chemistry research community in the Latin America and Caribbean region. *Bull. Am. Meteorol. Soc.*, **97**(10), 1929–1939. <https://doi.org/10.1175/BAMS-D-14-00267.1>
28. Brasseur, G. P., & Gallardo, L. 2016. Climate services: Lessons learned and future prospects. *Earth's Futur.*, **4**(3), 79–89. <https://doi.org/10.1002/2015EF000338>
29. Henriquez, A., Osses, A., Gallardo, L., & Resquin, M. D. 2015. Analysis and optimal design of air quality monitoring networks using a variational approach. *Tellus, Ser. B Chem. Phys. Meteorol.*, **6**(1), 25385. <https://doi.org/10.3402/tellusb.v67.25385>
30. Molina, L. T., Gallardo, L., Andrade, M., Baumgardner, D., Borbor-Córdova, M., Bórquez, R., Casassa, G., Cereceda-Balic, F., Dawidowski, L., Garreaud, R., Huneus, N., Lambert, F., McCarty, J. L., Mc Phee, J., Mena-Carrasco, M., Raga, G. B., Schmitt, C., & Schwarz, J. P. 2015. Pollution and its impacts on the South American Cryosphere. *Earth's Futur.*, **3**(12), 345–369. <https://doi.org/10.1002/2015EF000311>
31. Lambert, F., Tagliabue, A., Shaffer, G., Lamy, F., Winckler, G., Farias, L., Gallardo, L., & De Pol-Holz, R. 2015. Dust fluxes and iron fertilization in Holocene and Last Glacial Maximum climates. *Geophys. Res. Lett.*, **42**(14), 6014–6023. <https://doi.org/10.1002/2015GL064250>
32. Escribano, J., Gallardo, L., Rondanelli, R., & Choi, Y. S. 2014. Satellite retrievals of aerosol optical depth over a subtropical urban area: The role of stratification and surface reflectance. *Aerosol Air Qual. Res.*, **14**(3), 596–607. <https://doi.org/10.4209/aaqr.2013.03.0082>
33. Osses, A., Gallardo, L., & Faundez, T. 2013. Analysis and evolution of air quality monitoring networks using combined statistical information indexes. *Tellus, Ser. B Chem. Phys. Meteorol.*, **65**(1), 1–17. <https://doi.org/10.3402/tellusb.v65i0.19822>
34. Von Glasow, R., Jickells, T. D., Baklanov, A., Carmichael, G. R., Church, T. M., Gallardo, L., Hughes, C., Kanakidou, M., Liss, P. S., Mee, L., Raine, R., Ramachandran, P., Ramesh, R., Sundseth, K., Tsunogai, U., Uematsu, M., & Zhu, T. 2013. Megacities and large urban agglomerations in the coastal zone: Interactions between atmosphere, land, and marine ecosystems. *Ambio*, **42**(1), 13–28. <https://doi.org/10.1007/s13280-012-0343-9>

Books and book chapters

- Szopa, S., V. Naik, B. Adhikary, P. Artaxo, T. Berntsen, W.D. Collins, S. Fuzzi, **L. Gallardo**, A. Kiendler-Scharr, Z. Klimont, H. Liao, N. Unger, and P. Zanis, 2021: Short-Lived Climate Forcers. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 817–922, doi: 10.1017/9781009157896.008.
- Carles, M., Huidobro, C., Gallardo, L., Urquiza, A., Billi, M., Smith, P., et al. (2020). “Chile, Santiago: Climate change challenges and governance,” in *CITY-TO-CITY PARTNERSHIPS AND SOUTH-SOUTH AND TRIANGULAR COOPERATION ON SUSTAINABLE URBAN DEVELOPMENT: Urban planning and management and its impacts in addressing climate change and fostering sustainable development* (United Nations Office for South-South Co), 111–118. Available at: <https://www.unsouthsouth.org/wp-content/uploads/2020/06/City-to-City-Report.pdf>.
- UNEP and CCAC 2016. *Integrated Assessment of Short-Lived Climate Pollutants for Latin America and the Caribbean: improving air quality while mitigating climate change. Summary for decision makers.* United Nations Environment Programme. Nairobi, Kenya. Available at: <http://www.ccacoalition.org/en/resources/integrated-assessment-short-lived-climate-pollutants-latin-america-and-caribbean-summary>
- Zhu, T., Parrish, D. D., Gauss, M., Doherty, S., Lawrence, M., **Gallardo, L.**, Kanakidou, M., et al. 2012. *The Impacts of Megacities on Air Quality and Climate Change: An IGAC Perspective WMO/GAW Report 205*, ISBN: 978-0-9882867-0-2 Available at: http://www.wmo.int/pages/prog/arep/gaw/documents/Final_GAW_205.pdf
- Melamed, M., Gauss, M., Heald, Collette, H., Richter, A., Buchwitz, M., **Gallardo, L.**, Huneus, N., van der Gon, H., Matus, P., Parrish, D., and Lawrence, M. 2012. Chapter 1, Introduction. Pages, 1-27.
- Gallardo, L.**, Alonso, F., Andrade, M. F., Barreto-Carvalho, V., Behrentz, E., de Castro-Vasconcellos, P., D’Angiola, A., Dawidowski, L., Freitas, S., Gómez, D., Longo, K. M., Doprichinski-Martins, L., Mena, M., Matus, P., Osses, A., Osses, M., Rojas, N., Saide, P., Sánchez-Ccoyllo, O., Toro, M. V., 2012. Chapter 4, South America, Pages, 141-171.
- Zhu, T., Lawrence, M., Gauss, M., Parrish, D., Molina, Luisa T., **Gallardo, L.**, Romero-Lankao, P., Kondo, Y., Takegawa, N., Zhang, Y., Liousse, C., Jalkanen, L., and Carmichael, G., 2012. Chapter 7, Overview of International Collaborative Research Activities. Pages, 250-284.
- Parrish, D., **Gallardo, L.**, Zhu, T., Melamed, M. L., and Lawrence, M., 2012. Chapter 8, Key issues and outlook. Pages, 285-299.
- Beckers, T., Filmer, P., **Gallardo, L.**, Giancesella, S., Klink, C., Tourrand, J-F., Weingart, P., Woodrow, M., 2006. *Communicating Science for to the media, decision makers and the interested public*, Chapter 5 In *Linking the Sciences of Environmental Change to Society and Policy - lessons from 10 years of research networks in the Americas* eds H. Tiessen, M. Brklacich, G. Breulmann and R.S.C. Menezes (SCOPE 68, Island Press: Washington, D.C.) .

- Gallardo, L.**, 2006. Trazas atmosféricas y su modelación. Capítulo 4, en Contaminación atmosférica urbana : episodios críticos de contaminación ambiental en la ciudad de Santiago, Morales et al (Eds). Editorial Universitaria. ISBN: 956-11-1835-1
- Atmospheric Chemistry in a Changing World: An Integration and Synthesis of a Decade of Tropospheric Chemistry Research. Series: Global Change - The IGBP Series. Brasseur, Guy P.; Prinn, Ronald G.; Pszenny, Alexander A.P. (Eds.) 2003, XIV, 300 p., 131 illus., 52 in colour, Hardcover. ISBN-10: 3-540-43050-4. ISBN-13: 978-3-540-43050-63 (Contributing author).
- Matus, P., Farías, F. y **Gallardo, L.**, 2003. Política pública ambiental. Organización Panamericana de la Salud (OPS).
- Sausen, R., Hov, Ø., Johnson, C., Kelde, H., Köhler, I., Kraabøl, A., Ramarosan, R., Rohrer, F., Stordal, F., Strand, A., van Velthoven, P., Wauben, W., Lee, D., **Gallardo, L.**, Gardner, R., and Grobler, E., 1995: The impact of NO_x emissions from aircraft upon the atmosphere at flight altitudes 8-15 km, AERONOX, ed. U. Schumann. Office for Publications of the European Commission, Brussels (1995), pp. 471. (ISBN-92-826-8281-1). Sub-project 3, Global Atmosphere Model Simulations. Commission of European Communities, Brussels.
- Gallardo, L.**, 2006. Oxidized nitrogen in the troposphere: the role of lightning. Filosofie Doctor thesis. Department of Meteorology, Stockholm University. Akademityck AB, Edsbruk, Sweden, 172 pp. ISBN 91-7153-501-2.
- Gallardo, L.**, Rodhe, H. and Crutzen, P., 1993: Evaluation of a global 3-D model of the tropospheric odd nitrogen cycle. Licenciati thesis. Department of Meteorology, Stockholm University, 55 pp.

Other publications

- Billi, M., Moraga, P., Aliste, E., Maillet, A., O’Ryan, R., Sapiains, R., Bórquez, R. (2021). Gobernanza Climática de los Elementos. Hacia una gobernanza climática del agua, el aire, el fuego y la tierra en Chile, integrada, anticipatoria, socio-ecosistémica y fundada en evidencia. Retrieved from <https://www.cr2.cl/gobernanza-elementos/>
- Huneus, N., Urquiza A., Gayó, E., Osses, M., Arriagada, R., Valdés, M., Álamos, N., Amigo, C., Arrieta, D., Basoa, K., Billi, M., Blanco, G., Boisier, J.P., Calvo, R., Casielles, I., Castro, M., Chahuán, J., Christie, D., Cordero, L., Correa, V., Cortés, J., Fleming, Z., Gajardo, N., Gallardo, L., Gómez, L., Insunza, X., Iriarte, P., Labraña, J., Lambert, F., Muñoz, A., Opazo, M., O’Ryan, R., Osses, A., Plass, M., Rivas, M., Salinas, S., Santander, S., Seguel, R., Smith, P., Tolvett, S (2020). El aire que respiramos: pasado, presente y futuro – Contaminación atmosférica por MP_{2,5} en el centro y sur de Chile. Centro de Ciencia del Clima y la Resiliencia (CR)², (ANID/FONDAP/15110009), 102 pp. Disponible en www.cr2.cl/contaminacion/
- Gallardo, L., Basoa, K., Tolvett, S., Osses, M., Huneus, N., Bustos, S., et al. (2020). Mitigación de carbono negro en la actualización de la Contribución Nacionalmente Determinada de Chile: Resumen para tomadores de decisión. Santiago de Chile Available at: http://www.cr2.cl/wp-content/uploads/2020/04/Mitigacion_carbono_negro_NDC_Chile2020.pdf.
- CR², 2019. The Anthropocene in Chile: evidence and ways forward, Report to the Nations. Center for Climate and Resilience Research, CR². <http://www.cr2.cl/wp-content/uploads/2019/06/Report-Anthropocene-english.pdf>
- CREDEN. 2016. Estrategia Nacional de Investigación, Desarrollo e Innovación para un Chile resiliente frente a desastres de origen natural Consejo Nacional para la Innovación y el

- Desarrollo. Available at <http://www.cnid.cl/wp-content/uploads/2016/12/INFORME-DESASTRES-NATURALES.pdf>.
- CR2 2015. "Informe a la Nación La megasequía 2010-2015: Una lección para el futuro". Autores: Aldunce, P., Araya, G., Blanco, G., Boisier, J. P., Bozkurt, D., Carmona, A., Christie, D., Farías, L., **Gallardo, L.**, Galleguillos, M., González, M., Herrera, P., Huneus, N., Jiménez, D., Lara, A., Latoja, D., Lillo, G., Masotti, I., Moraga, P., Nahuelhual, L., Paredes, P., Ossandón, J., Rojas, M., Urquiza, A., Yévenes, M., Zambrano, M. 2015. Mega drought report to the nation. Center for Climate and Resilience Research, 28 pp. Santiago, Chile Available in <http://www.cr2.cl/megasequia/>
- Gallardo, L.** 2012. South American Emissions, Mega-cities, and Climate (SAEMC, <http://saemc.cmm.uchile.cl/>). Final Report for the Inter American institute for global change. CRN 2017.
- Gallardo, L.**, Jorquera, H., Molina, L. T., 2012. Tackling challenges in assessing air quality over South America. *Eos*, Vol. 93, No. 24, 12 June 2012
- Grados, C., Chaigneau, A., Takahashi, K., Dewitte, B., Garreaud, R., **Gallardo, L.**, 2010: VOCALS-REx Coastal Component / Componente Costera de VOCALS-REx. CLIVAR-Exchanges Newsletter, 15(1), 23-28.
- Gallardo, L.**, 2008. South American Mega-cities: Actions and perspectives. IGACNewsletters, 38, April 2008 (Disponible en <http://www.igac.noaa.gov/newsletter/>)
- Gallardo, L.**, 2008. Air Pollution In South America: A Global Change Driver and a Global Connector. Global Change NewsLetter No. 71 May 2008 (Disponible en: http://www.igbp.net/documents/NL_71-2.pdf).
- Wood, R., Bretherton, C., Fairall, C., **Gallardo, L.**, Esbensen, S., Feingold, G., Garreaud, R., Huebert, B., Leon, D., Mechoso, R., McWilliams, J., Miller, A., Pizarro, O., Rutllant, J., Snider, J., Takahashi, K., Weller, R., Wijesekera, H., Yuter, S., Doherty, S. 2006, VOCALS-Regional Experiment (VOCALS-REx) EXPERIMENTAL DESIGN OVERVIEW. Available at: http://www.eol.ucar.edu/projects/vocals/science_planning/VOCALS_SPO_rev_aug06.pdf
- IGAC (2006) Science Plan and Implementation Strategy. IGBP Report No. 56. IGBP Secretariat, Stockholm. 44pp. T. Bates, M. Scholes, S. Doherty, & B. Young (Eds.), Anderson, T., Bates, T., Bergin, M., Boucher, O., Burrows, J., Facchini, C., Fehsenfeld, F., Fuzzi, S., **Gallardo-Klenner, L.**, Hauglustaine, D., Jacob, D., Kasibhatla, P. Law, K., Lawrence, M., Leck, C., Liu, S., Lohmann, U., McKenna, D., Munthe, J., Noone, K., Platt, U., Parrish, D., Russell, L., Scholes, M., Thompson, A., and Venkataraman, Ch.. Disponible en: http://www.igacproject.org/sites/all/themes/bluemasters/images/SPIS_English_Version.pdf
- Gallardo, L.**, Sanhueza, E., Dawidowski, L., and Longo, K. 2006. IGAC/WMO Workshop, Santiago De Chile, October 13-14 2005. From Chemical Weather Forecasts to Climate Change in South America: The Challenges and Opportunities of Integration and Collaboration. IGACNewsletters, 33, May 2006
- Gallardo, L.**, Ortega, J., Olivares, G., Osses, A., Ramos, I., Cuevas, O., Muñoz, F., Amigo, A., Gaete, A., 2004. "Modelo de dispersión de contaminantes tipo penacho en la fundición Caletones, División El Teniente ". Informe final proyecto im2 n° 46/04.
- Muñoz, R., Garreaud, R., **Gallardo, L.**, Cabello, A., and Rosenbluth, B., 2003. Mejoría del conocimiento del recurso eólico en el norte y centro del país. Informe Final. Comisión Nacional de Energía (CNE).

- Gómez, L., **Gallardo, L.**, Sotomayor, P., 2002. Implementación de un Modelo de Dispersión Gaussiano para el Reactor Nuclear La Reina y Análisis de Datos Meteorológicos Locales. Informe final para la Comisión Nacional de Energía Nuclear (CCHEN).
- Strengthening of the Air Quality Information System (Working area 2): Application of a regional-scale model over the central part of Chile. National Commission for the Environment. Disponible en: http://www.dim.uchile.cl/~lgallard/S_disp/S_disp_Chile_central.htm
- Gallardo, L.**, Olivares, G., Aguayo, A., Langner, J., Aarhus, B., 1999. Regional dispersion of oxidized sulfur over Central Chile: a summer case
- Gallardo, L.**, Olivares, G., Aguayo, A., Langner, J., Aarhus, B., 1999. Regional dispersion of oxidized sulfur over Central Chile: a fall case
- Gallardo, L.**, Olivares, G., Aguayo, A., Langner, J., Aarhus, B., Gidhagen, L., 2000. "Regional Dispersion of Oxidized Sulfur over Central Chile Using the HIRLAM – MATCH System".
- Gallardo, L.**, and Gidhagen, L. 2001. Application of a regional-scale model over the central part of Chile. Final Report for SIDA. Disponible en: http://www.dim.uchile.cl/~lgallard/S_disp/S_disp_Chile_central.htm
- Gallardo, L.** and Rodhe, H., 1995: Evaluation of a global 3-D model of tropospheric oxidized nitrogen. Report CM-85, International Meteorological Institute in Stockholm, Department of Meteorology, Stockholm University.
- Gallardo, L.**, Kjellström, E. and Feichter, J. 1995: Representation of the global emission of oxidized nitrogen by lightning discharges in large-scale models. Report CM-87, International Meteorological Institute in Stockholm, Department of Meteorology, Stockholm University.

WORK EXPERIENCE

2022-present Director for postgraduate studies, University of Chile

2019-present Full professor at Department of Geophysics, University of Chile

2012-2019 Head of Center of Excellence

2012-2012 Head of Department, Department of Geophysics, University of Chile

2007- 2019 Associate Professor at Department of Geophysics, University of Chile

1998- 2007 Part-time teacher at Department of Geophysics, University of Chile

2001-2012 Associated researcher at the Center for Mathematical Modeling, University of Chile.

1997-2001 Scientific Advisor for the Chilean Environmental Agency (Comisión Nacional del Medio Ambiente, CONAMA).

1990-1996 Teaching and research at Department of Meteorology, Stockholm University

1988-1989 Several employments including language teaching (Spanish) and cleaning

1986-1987 Research assistant, Department of Geophysics, University of Chile

Other Appointments / Memberships

- Member of the Permanent Advisory Commission on Climate Change for the Presidency of the Republic in Chile (2017)
- Member of the Commission on Natural Disasters and Resilience of the National Council for Innovation and Development (2015-2017)
- Scientific Committee member of the Surface Ocean - Lower Atmosphere Study (SOLAS) project (2018-2020)
- Vice-president for the International Association of Meteorology and Atmospheric Science (IAMAS) (2014-2018)
- Vice-president for the international Commission for Atmospheric Chemistry and Global Pollution (iCACGP) (2010-2014)
- Scientific Committee member of the International Global Atmospheric Chemistry (IGAC) program (2003-2009)
- Member of the European Geophysical Union
- Member of the American Geophysical Union
- Member of the Editorial Board of Tellus B (2006-)
- Member of the Editorial Board of Urban Climate (2012-)
- Member of the Editorial Board of Air Quality, Atmosphere & Health (2008-2020)

Guided students

Acting as advisor

1. **Luis Gómez, 2022.** Caracterización meteorológica de los episodios extremos de contaminación por material particulado fino en Coyhaique, Patagonia, Chile (<https://repositorio.uchile.cl/handle/2250/184588>). Tesis para optar al grado de M.Sc. Meteorología y Climatología. Co-guide Dr. Nicolás Huneus.
2. **Camilo Menares, 2020.** Aerosoles secundarios en Santiago de Chile: estado y tendencias. (<http://repositorio.uchile.cl/handle/2250/176992>). Tesis para optar al grado de M.Sc. Meteorología y Climatología. Co-guide Dr. Nicolás Huneus. Defended with honors in May 2016.
3. **Andrea Orfanoz Cheuquelaf, 2016.** Estratificación vertical y transporte viento abajo de contaminantes urbanos de Santiago de Chile (<http://repositorio.uchile.cl/handle/2250/139755>). Tesis para optar al grado de M.Sc. Meteorología y Climatología. Co-guide por Dr. Nicolás Huneus. Defended with honors in May 2016.
4. **Adolfo Henríquez, 2014.** Herramientas matemáticas para el análisis de sistemas de observación atmosféricos. Tesis para optar al grado de M.Sc. Meteorología y Climatología y al título de Ingeniero Civil Matemático. Co-guide Dr. Axel Osses. Defended with honors in July 2014.
5. **Jerónimo Escribano,** Capa límite, reflectancia y espesor óptico de aerosoles sobre Santiago. Co-guiada por Roberto Rondanelli. Defended with honors in October 2012.
6. **Félix Carrasco, 2012.** Mejoras en la señal satelital de dióxido de azufre de megafuentes en Chile central. Tesis para optar al grado de M.Sc. Meteorología y Climatología y al título de Ingeniero Civil Matemático. Co-guiada por Dr. Axel Osses. Defended in August 2012.
7. **Carlos Castillo, 2011** “Azufre oxidado sobre Chile central: emisiones, dispersión e impactos”. Tesis para optar al grado de M.Sc. Meteorología y al título de Ingeniero Civil en Minas. Departamento de Geofísica y Departamento de Ingeniería Civil de Minas. Universidad de Chile. Defended with honors in August 2011.
8. **Rodrigo Arroyo, 2010.** “Implementación y validación del modelo CCATTBRAMS sobre la zona central de Chile. Tesis para optar al grado de M.Sc. Meteorología. Departamento de Geofísica. Universidad de Chile. Co-guiada por Dr. Karla Longo (INPE). Defended in September 2010.
9. **Isabel Ramos, 2009,** “Evaluación de un Modelo Climático Regional sobre la Zona de Estratocúmulos del Pacífico Sureste”. Tesis para optar al grado de M.Sc. Meteorología. Departamento de Geofísica. Universidad de Chile. Co-guiada por Dr. Maisa Rojas. Defended in June 2009.
10. **Alejandra Oyanadel, 2007.** “Comparación y análisis de observaciones remotas e in situ de carga de aerosoles en Chile”. Memoria de título de Meteorología, Universidad de Valparaíso. Defended in January 2007.
11. **Omar Cuevas, 2006.** “Análisis de ozonsondas en Rapanui: climatología, masas de aire y su impacto en el ozono troposférico”. Memoria de título de Meteorología, Universidad de Valparaíso. Co-guiada con Juan Quintana, Dirección Meteorológica de Chile. Defended in January 2006.

12. **Cristian Bustos, 2004.** "Revisión de la aplicación de modelos gaussianos a la evaluación de impactos de fuentes puntuales sobre la calidad del aire" M.Sc. Planificación y Manejo Ambiental, Universidad de Chile. Defended in December 2004.
13. **Álvaro Amigo, 2004.** "Estimación de Emisiones Volcánicas de Azufre Oxidado en Chile: Modelación de erupciones recientes del volcán Láscar". Geología, Universidad de Chile. Co-guiada por Gabriel Vargas. Defended in April 2004.
14. **Rafael Valdés, 2003.** " Análisis de sondeos de ozono troposférico realizados en Isla de Pascua (1996-2002): tendencias y representatividad". Química Ambiental. Defended in July 2003.
15. **Nicolás Huneus, 2003.** "Dispersión de azufre oxidado en el norte de Chile" M.Sc. Ciencias Atmosféricas, Universidad de Chile. Co-guiada por Dr. José Rutllant. Defended with honors in July 2003.
16. **Roberto Rondanelli, 2001.** "Caracterización sinóptica de la estación de Cerro Tololo y análisis de las observaciones de ozono", M.Sc. Ciencias Atmosféricas, Universidad de Chile. Co-guiada por Dr. René Garreaud. Defended with honors in December 2001.
17. **Gustavo Olivares, 2001** "Dispersión de azufre oxidado en Chile central", M.Sc. Ingeniería Química, Universidad de Chile . Defended with honors in October 2001.

Acting as co-advisor (Completed)

18. **Cristián Ibarra,** "Antecedentes para la evaluación del impacto de contaminación atmosférica por ozono sobre actividades agrícolas de la en Chile". Memoria de título de Ingeniería Civil Química, Universidad de Chile. Co-guiada con Christian Santana de la Comisión Nacional de Energía. Diciembre de 2003.
19. **Milenko Obilinovic, 2005.** "Desarrollo de un traductor general de formatos de datos para modelos atmosféricos". Memoria de título de Ingeniería Civil en Computación, Universidad de Chile. Co-guiada con Nancy Hitschfeld del Departamento de Ciencias de la Computación, Universidad de Chile. Defended in January 2005.
20. **Pablo Saide.** "Emisiones de monóxido de carbono en Santiago de Chile: distribución espacial y optimización por modelación inversa". MSc thesis and exam in Mechanical Engineering, Universidad de Chile. The thesis was defended with honors March 2008.
21. **Matías Bravo.** Sistema para obtención de dosel urbano simulaciones atmosféricas, caso de prueba Santiago de Chile. M. Sc. Computación, Universidad de Chile. Guía Nancy Hitschfeld.
22. **Santiago Parraguez, 2021.** Improving OMI-NO₂ spatial resolution using a stochastic convolutional neural network over central southern Chile (<https://repositorio.uchile.cl/handle/2250/184385>). MSc thesis and exam in Mechanical Engineering, Universidad de Chile. Guide: Viviana Meruane.
23. **Melisa Díaz Resquín (2023).** Aerosol dynamics in the Metropolitan Area of Buenos Aires. PhD Universidad de Buenos Aires. Co-guided by Laura Dawidowski (Universidad de Buenos Aires) y Laura Gallardo (Universidad de Chile).