Lucas A. Garibaldi

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Keywords: bees, agronomy, biodiversity, quantitative methods, landscape ecology.

I am motivated by research to promote sustainable productive transitions focusing on biodiversity, healthy food production, and physical and mental well-being. My studies have been quantitative and applied, using a variety of methodologies. I have contributed to developing technologies such as multifunctional landscape design (AgroDesign) and a spatially explicit platform for bee and biodiversity monitoring (Eirú). Over the last ten years, I have coordinated large inter- and transdisciplinary working groups, fostering inclusive processes that transform the environment with clear objectives based on monitoring, evaluation, and adaptive learning.

Networking and communication have been central to my career. I have volunteered in intergovernmental science-policy platforms, with farmers' and beekeepers' associations, institutional representations, media, drafting legislation, public lectures, and audiovisual series. One of my most prominent roles was co-chairing the Transformational Change Assessment of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES). I have also been involved in hundreds of local social work and volunteer activities for over 25 years.

I decided to stay in Argentina to actively contribute to the training of students and the creation of institutes of excellence. Since the age of 18, I have been teaching continuously at the University and have worked intensively on creating the Institute for Research on Natural Resources, Agroecology and Rural Development (IRNAD, UNRN, and CONICET). Every year, I present projects to raise national and international funds to support IRNAD and regional and national development. I have traveled to all continents to give lectures and participate in workshops, creating collaborative links to find solutions to local and global problems, using this valuable capital within and outside the academy.

Personal information: I was born on 21 May 1981 and raised a family with Ayelén and our children Luz, Juan, Ana, and Pedro. I also dedicate my life to Ashtanga Yoga and Tibetan Buddhism. In addition, my family and I run a conservation and sustainable production project with native plants on a 220-hectare farm in northwestern Patagonia, Argentina. I am motivated to solve problems related to production and the environment through dialogue between different disciplines and knowledge, based on principles and values such as equity, justice, pluralism, inclusion, respect, and reciprocal and interdependent relationships between nature and people.

CONTACT

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- website
- google scholar
- orcid
- intagram
- x
- linkedin

I'm the author or co-author of **207** articles, **12** books (7 as the first author), and **28** chapters or sections within books. My works have been cited in **29,745** publications (h index = 62, Google Scholar) and have been published in prestigious scientific journals (e.g., 6 articles in Science and others in Nature and PNAS). I have published in collaboration with more than **1,000** colleagues from different regions around the globe. I have been an invited speaker at **165** conferences (90 abroad and 75 in Argentina), and I have delivered **136** presentations at national and international scientific meetings. I have also actively participated in numerous workshops overseas. My contributions extend to directing **30** Research Projects, **14** Extension, Technology, Outreach, Volunteering, or Social Work Projects, and overseeing various inter-institutional agreements and providing several high level technical services (STAN). I have held editorial roles in prestigious scientific journals, as well as reviewed or edited numerous articles and research projects for various journals and institutions. I have served as a referee for numerous postgraduate theses and competitions for the selection (or evaluation) of educators, researchers, scholarship recipients, and technical personnel. I have had the privilege of instructing in **94** courses, spanning undergraduate, postgraduate, and professional training levels. Additionally, I have taken on the role of supervisor or co-supervisor for a total of **11** researchers, **45** thesis students (both at the undergraduate and postgraduate levels), **18** postdoctoral fellowships, **27** doctoral fellowships, and **38** teaching assistants or interns. My engagement with the community has encompassed participation in over **550** activities. I have received **23** awards, including the Konex Award, Golden Bee Award, the Houssay Award, the National Academy of Exact, Physical, and Natural Sciences award, the Bunge y Born Foundation award, and various distinctions from the National Senate and the Argentine Chamber of Deputies.

Academic degrees

• **Ph.D. in Agricultural Sciences.** Alberto Soriano Graduate School (EPG), Faculty of Agronomy, University of Buenos Aires (FAUBA). Summa cum laude. Apr 2005 - Mar 2010.
• **Agricultural Engineer.** FAUBA. Average grade: 8.9 (Honor Diploma). Mar 2000 - Apr 2004.

Current positions

RENTED POSITIONS

• Director, Institute for Research in Natural Resources, Agroecology and Rural Development (IRNAD), Andean Headquarters - National University of Río Negro (SA-UNRN) and National Scientific and Technical Research Council (CONICET).
• Principal Researcher, CONICET.
• Regular Full Professor, SA-UNRN.

AD-HONOREM POSITIONS

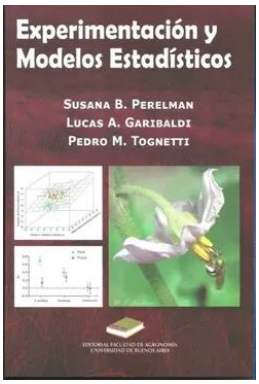
• Member of Category 2 Academics of the Graduate College, Udelar.
• Co-chair Transformative Change Assessment, IPBES.
• Director, PITES - Agroecology in Argentina.
• Professor, DMCySI - FAUBA.
• President, Pollination and Bee Flora Commission, APIMONDIA.
• Member, Expert Advisory Group on Invertebrate Pollinators, FAO.
• Member, Advisory Council of the Beekeeping Program - PROAPI, INTA.
• Member, Advisory Council of the Ecophysiology and Agroecosystems Program, INTA.
• Member, Panel of Experts, Chacra Pergamino-Colón (Aapresid).
• Substitute, University Counselor for the Professors' teaching staff, CICADyTT - UNRN.
• External Advisory Board, Safeguard Project (Safeguarding European wild pollinators), EU.
• Curator of the IRNAD Entomological Collection.

SOME PREVIOUS POSITIONS

• (2019-2023) Titular, University Counselor for the Professors teaching staff, CICADyTT - UNRN.
• (2019-2023) Substitute, Headquarters Counselor for the Professors teaching staff, CICADyTT, SA - UNRN.
• (2013-2022) Associate Editor, Ecología Austral, Asociación Argentina de Ecología (AsAE).
• (2016-2022) Associate Editor, Journal of Applied Ecology, British Ecological Society (BES).
• (2019-2021) Member of the Academic Committee of the Master in Agroecology, UNRN.
• (2016-2019) Coordinator Lead Author of Chapter 2 of the Global assessment of biodiversity and ecosystem services, IPBES.
• (2013-2018) Editorial board member of Basic and Applied Ecology (Gesellschaft für Ökologie).
• (2014-2016) Coordinator Lead Author of Chapter 4 of the Assessment on pollinators, pollination and food production, IPBES.
• I've been a Counselor for the Faculty of Teachers uninterruptedly since 2015 (Headquarters and University councils, UNRN).

University teaching

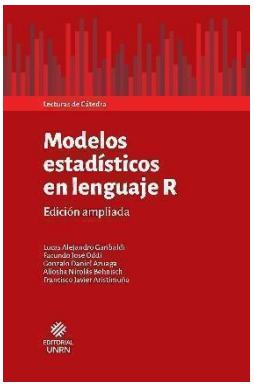
I've uninterruptedly taught during both semesters for the past 25 years. Teaching has been one of my greatest motivations, giving numerous courses during my doctoral and postdoctoral studies. My courses focus mainly on statistical models applied to economic, environmental, and agronomic sciences and the study of agroecological systems and ecosystem services. These disciplines are directly linked to my research work and are the basis for developing models that contribute to a predictive science for preventing socio-environmental problems and proposing solutions. I've taught **94 undergraduate and graduate courses** (both in Argentina and abroad) and authored or co-authored dozens of study guides, didactic articles in peer-reviewed journals, and books published by different national universities, for example:



Garibaldi LA, Oddi FJ, Azuaga GD, Behnisch AN y Aristimuño FJ (2023) Modelos estadísticos en lenguaje R. 2a ed., 282 págs., Editorial UNRN, Argentina. ISBN 978-987-8258-14-0.

Perelman SB, Garibaldi LA y Tognetti PM – eds- (2019) Experimentación y modelos estadísticos, 1a ed., 348 págs, Editorial FAUBA, CABA, Argentina. ISBN 978-987-3738-22-7.

Garibaldi LA, Casas C y Biganzoli F (2014) Datos jerárquicos en ciencias ambientales: ejemplos prácticos y análisis de modelos jerárquicos en lenguaje R. 1a ed., 242 págs., Bariloche, Argentina. ISBN 978-987-33-6434-1.



My teaching career in Argentina began in Analytical Chemistry (FAUBA), continued in Ecology, and later in the Department of Quantitative Methods and Information Systems (DMCySI). I especially highlight Susana Perelman among the great professors who have guided me on this path. In my teaching career, I've occupied every rank of the Argentine university system (Second Assistant, First Assistant, Head of Practical Works, Adjunct Professor, Associate Professor, Full Professor), having obtained these positions in public and open competitions in multiple instances, in different universities, and with different juries. Currently, I'm a full professor at the National University of Río Negro and an ad-honorem professor at the FAUBA.

Human Resources

I decided to stay in Argentina and actively play a role in shaping the education of students as well as the creation of institutes of excellence within the country. My work primarily focuses on guiding and supporting students, graduate students, and researchers at all stages of their learning and development. These responsibilities have been a part of my career since the very beginning and have provided me with a variety of tools and strategies to identify areas of interest, encourage collaboration among colleagues, and build effective teams. Thanks to my experience, I have been able to lead large working groups in various contexts, such as intergovernmental platforms, large projects involving over a hundred members, research teams, and university chairs. My primary goal is to create an inclusive and welcoming work environment where people feel valued and motivated to achieve their goals. I aim to provide a diverse range of study topics that appeal to individuals from different fields. My ultimate goal is to contribute to the training of professionals who will use their knowledge and experience to shape the future of research and technological development in Latin America.

Research

I have been involved in agroecology for over 20 years. Initially, my work focused on social vocation, working in farming communities in the interior of Argentina, particularly in Santiago del Estero and Formosa. Later, I pursued doctoral and postdoctoral studies in the field of ecology applied to agricultural and forestry systems with growing enthusiasm. Throughout my career, I have integrated various ecological and socioeconomic aspects to promote research and development of technologies for sustainable productive transitions. My passion for bees started in high school, and I have incorporated it into my research in agroecology. As a researcher, I have had the privilege of collaborating with numerous professionals and producers linked to various institutions worldwide, including universities, NGOs, companies, and civil associations. Many of the papers resulting from these collaborations have been published in prestigious scientific journals worldwide, such as six articles in Science, 7 in Trends in Ecology & Evolution, 4 in Nature Ecology & Evolution, 2 in Proceedings of the National Academy of Sciences, 3 in Ecology Letters, 1 in Nature, and 2 in Proceedings of the Royal Society of London B.

MOST OUTSTANDING ARTICLES AS FIRST AUTHOR

- **Garibaldi LA**, Steffan-Dewenter I, Winfree R, et al. (2013) Wild pollinators enhance fruit set of crops regardless of honey-bee abundance. Science 339:1608-1611.
- **Garibaldi LA**, Steffan-Dewenter I, Kremen C, et al. (2011) Stability of pollination services decreases with isolation from natural areas despite honey bee visits. Ecology Letters 14:1062-1072.

• **Garibaldi LA**, Carvalheiro LG, Leonhardt SD, et al. (2014) From research to action: enhancing crop yield through wild pollinators. Frontiers in Ecology and the Environment 12:439-447.
• **Garibaldi LA**, Carvalheiro LG, Vaissière BE, et al. (2016) Mutually beneficial pollinator diversity and crop yield outcomes in small and large farms. Science 351:388-391.
• **Garibaldi LA**, Aizen MA, Klein AM, Cunningham SA & Harder LD (2011) Global growth and stability in agricultural yield decrease with pollinator dependence. Proceedings of the National Academy of Sciences, USA 108:5909-5914.
• **Garibaldi LA**, Gemmill-Herren B, D'Annolfo R, Graeub BE, Cunningham SA & Breeze TD (2017) Farming approaches for greater biodiversity, livelihoods and food security. Trends in Ecology & Evolution 32:68-80.
• **Garibaldi LA**, Bartomeus I, Bommarco R, et al. (2015) Trait matching of flower visitors and crops predicts fruit set better than trait diversity. Journal of Applied Ecology 52:1436-1444.

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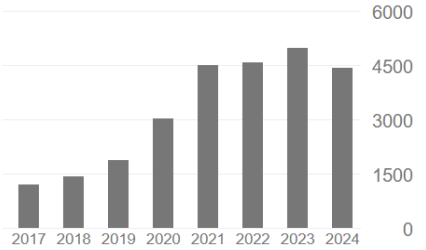

• **Garibaldi LA**, Oddi FJ, Miguez FE, Bartomeus I, et al. (2021) Working landscapes need at least 20% native habitat. Conservation Letters 14:e12773.
• **Garibaldi LA**, Pérez-Méndez N, Garratt MPD, Gemmill-Herren B, Miguez FE & Dicks LV (2019) Policies for ecological intensification of crop production. Trends in Ecology and Evolution 34:282-286.
• **Garibaldi LA**, Kitzberger T and Chaneton EJ (2011) Environmental and genetic control of insect abundance and herbivory along a forest elevational gradient. Oecologia 167:117-129.
• **Garibaldi LA**, Sáez A, Aizen MA, Fijen T & Bartomeus I (2020) Crop pollination management needs flower visitor monitoring and target values. Journal of Applied Ecology 57:664–670.
• **Garibaldi LA** & Pérez-Méndez N (2019) Positive outcomes between crop diversity and agricultural employment worldwide. Ecological Economics 164:106358.
• **Garibaldi LA**, Pérez-Méndez N, Cordeiro GD, et al. (2021) Negative impacts of dominance on bee communities: Does the influence of invasive honey bees differ from native bees? Ecology e03526.
• **Garibaldi LA**, Gómez Carella DS, Nabaes Jodar DN, Smith MR, Timberlake TP & Myers SS (2022) Exploring connections between pollinator health and human health. Philosophical Transactions B 377:20210158.
• **Garibaldi LA**, Zermoglio PF, Jobbágy EG, et al. (2023) How to design multifunctional landscapes? Journal of Applied Ecology, 60:2521-2527.

FIVE MOST CITED ARTICLES WITH MY STUDENTS

• Rollin O & **Garibaldi LA** (2019) Impacts of honeybee density on crop yield: A meta-analysis. Journal of Applied Ecology 56:1152-1163.
• Geslin B, Aizen MA, Garcia N, et al., **Garibaldi LA** (2017) The impact of honey bee colony quality on crop yield and farmers' profit in apples and pears. Agriculture, ecosystems & environment 248:153-161.
• Requier F, Antúnez K, Morales CL, et al., **Garibaldi LA** (2018) Trends in beekeeping and honey bee colony losses in Latin America. Journal of Apicultural Research 57:657-662.
• Zamorano J, Bartomeus I, Grez AA & **Garibaldi LA** (2020) Field margin floral enhancements increase pollinator diversity at the field edge but show no consistent spillover into the crop field: a meta-analysis. Insect Conservation and Diversity 13:519-531.
• Pérez-Méndez N, Andersson GKS, Requier F, et al., **Garibaldi LA** (2020) The economic cost of losing native pollinator species for orchard production. Journal of Applied Ecology 57:599-608.

FIVE MOST CITED ARTICLES AS CO-AUTHOR

• Díaz S, Settele J, Brondízio, et al., **Garibaldi LA**, et al. (2019) IPBES: Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Bonn, Germany.
• Díaz S, Settele J, Brondízio E, et al., **Garibaldi LA**, et al. (2019) Pervasive human-driven decline of life on Earth points to the need for transformative change. Science 366:eaax3100.
• Potts SG, Imperatriz-Fonseca V, Ngo HT, et al., **Garibaldi LA**, et al. (2016) Safeguarding pollinators and their values to human well-being. Nature 540:220-229.
• Kennedy C, Lonsdorf E, Neel MC, et al., **Garibaldi LA**, et al. (2013) A global quantitative synthesis of local and landscape effects on native bee pollinators in agroecosystems. Ecology Letters 16:584-599.
• Rader R, Bartomeus I, **Garibaldi LA**, et al. (2016) Non-bee insects are important contributors to global crop pollination. PNAS 113:146-151.

Geographic distribution of co-authors

Bringing science into action

Conciencia is a family dream that for 20 years has focused on the conservation of biodiversity, biodiversity education and the development of scientific projects in collaboration with universities, other public institutions, and NGOs. Its activities include the enrichment of the native forest through the planting of native trees, the exclusion of cattle to allow the forest to regenerate, the active removal of exotic species, the construction of infrastructure and management to prevent fires, as well as lectures and other educational activities. The property covers 220 hectares and is located in the northwest of Argentine Patagonia, near the Manso River and the El Foyel area.

I've been Coordinator Lead Author (CLA), scientific advisor, and author for several international organizations, including FAO (Food and Agriculture Organization) and IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). In these platforms, I've managed large workgroups with professionals from multiple disciplines. I was invited by IPBES to coordinate a part of the Assessment Report on Pollinators, Pollination and Food Production and the Global Assessment Report on Biodiversity and Ecosystem Services, published in 2016 and 2019 respectively. Through these works, I've contributed to the knowledge about the current state of biodiversity and its impact on human well-being, while integrating producers, the private sector, policymakers, and consumers into different proposals. In 2022 I was assigned as co-chair of the new Transformative Change Assessment. For three years, I'll be leading more than 200 experts from around the world to assess the changes needed for sustainable use of natural resources. In other contexts, I have developed a variety of tasks aimed at supporting political decisions and new legislation with scientific information: for example, I've worked on public reports, texts for politicians, and workshops. I also participate in the drafting of various bills, such as the 'law for Minimum budgets for biodiversity in cultivated environments' (File number 4543/17 National Senate, Argentina).

Bees have been a passion of mine since high school. I'm the President of the Pollination and Bee Flora Commission of the International Federation of Beekeeping Associations

(Apimondia), where I work to promote the role of bees as pollinators of agricultural crops and natural flora, as well as the importance of plants as their food sources. In addition, I co-founded the technology-based company Eirú (proposed as a technology-based company - CONICET, SF Build program of the SF500 investment fund), targeting agricultural producers and beekeepers. Eirú is a technological platform based on a model of pollinator behavior to optimize crop productivity and maintain diversity by managing ecosystem services by prescribing the location of hives and evaluating the consequences of changes in the landscape. I am also a co-founder of AgroDesign (proposed as a technology-based company - CONICET), a company dedicated to the use of geospatial and temporal information to redesign large agricultural landscapes. The goal is to reduce external inputs through regulations that provide new designs of productive plots, combined with a biodiversity matrix that provides ecosystem services.

Audiovisual production

I work closely with content production experts to produce audiovisual materials for science communication. Our work covers a variety of media, such as recordings, animations, and photographs, and ranges from brochures to documentaries broadcasted in local and national media. Through this production, we aim to document and communicate ideas, emotions, and information about the research carried out at IRNAD.

- CIENTIFICA Documentary Series. Episode 3 - Regenerative Agriculture: video.
- Bee health and its impact on human health. Apimondia, CPCA - UNRN: video.
- Did you know that... it is possible to produce food without destroying the environment (2021). CCT-CONICET-PN: video.
- How to manage crop pollination? (2021). Apimondia, CPCA - UNRN: video.
- Reflections in a minute (2020-present). CPCA - UNRN.
  - More biodiversity and fewer agrochemicals: a large-scale case: video.
  - Towards more diverse agroecosystems: a small-scale success story: video.
  - Agriculture needs more natural environments for a better production: video.
  - Multifunctional landscapes: the key to Sustainable Agriculture: video.
  - Agroecological model of pig production vs the industrial model: video.

- #UniversidadPuente - National University of Río Negro (2020). CIN - UNRN: website.
- Life and Earth: Biodiversity and Agroecology (2018). CPCA - UNRN. Chapters 1-6: website.
- Interactions (2017). CPCA - UNRN: Link 1 and Link 2.

Institutional management

I've obtained different positions in national and international organizations. In addition to being director of IRNAD, I've been a Counselor for the UNRN's Professors teaching staff since 2015. I've also been part of advisory boards of national programs (e.g., INTA), academic committees (e.g., Master of Agroecology - UNRN), and editor of scientific journals (e.g., Journal of Applied Ecology), in addition to acting as an advisor for institutions dedicated to the promotion of science and technology. These collaborations imply, among other responsibilities, mentoring of administrative staff, mentoring of technicians at the lab and the field, discussions with decision-makers, and the implementation of institutional strategies.

Featured Awards

• Konex Awards 2023: Science and Technology. 100 most outstanding personalities of the last decade of Argentine Science and Technology (2013-2022), Agricultural and Food Sciences area. Konex Foundation (May 2023).
• Golden Bee Award. Ministry of Agriculture, Forestry and Food, Republic of Slovenia. The President of the Republic of Slovenia, Borut Pahor, presents the award (Dec. 2021).
• Honorable Mention for Scientific Value, Honorable Senate of the Argentine Nation (Dec. 2019).
• 2019 Bunge y Born Foundation Stimulus Award, area: Ecology. Bunge y Born Foundation (Jun. 2019).
• Houssay Award 2017, area: Environmental Sciences and Technologies. Delivered by the President of the Argentine Nation. Ministry of Education, Culture, Science and Technology, Presidency of the Argentine Nation (Dec 2018).
• Most outstanding youth in achievement and academic leadership. JCI TOYP Argentina Awards 2018: The 10 most outstanding young people of the Argentine Republic. JCI Argentina - Argentine Chamber of Commerce and Services (Nov. 2018).
• The National Senate declares “Of interest to this Senate, the work carried out by the researcher of the National Scientific and Technical Research Council (CONICET) and the National University of Río Negro (UNRN), Lucas Garibaldi, (...)". File S-1364-16 (June 2016).
• Honor Diploma in recognition of Dr. Garibaldi's academic activity and his scientific research. Honorable Senate of the Nation (May 2016).
• National Academy of Exact, Physical and Natural Sciences Award - 2015 - Chemical, Earth, and Biological Sciences Section, Biological Sciences area.
• The Chamber of Deputies declare of interest the research entitled 'Wild pollinators increase crop fruit set regardless of honey bees'.
• The article Garibaldi et al. 2013 Science 339: 1608-1611 was considered the most important scientific discovery of 2013 by La Recherche magazine (January 2014, number 483): Le top 10 des découvertes de l'année (Jan. 2014).