Pierre Legendre
Curriculum vitae

Département de sciences biologiques,
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https://en.wikipedia.org/wiki/Pierre_Legendre_(ecologist)

Short CV

Biographical information

1971	Ph.D. in Evolutionary Biology, Dept. of Biology, Univ. of Colorado (Boulder), USA.
1969	M.Sc. in Zoology, Department of Zoology, McGill University.
1965–67	Two years of B.Sc. in biological sciences, Université de Montréal.
1965	B.A., Collège Saint-Viateur, Montréal (college affiliated to Université de Montréal).
1946	Born in Montréal, Qc, Canada

Academic employment history

2025	Emeritus professor, Université de Montréal
1984–2024	Full professor, Département de sciences biologiques, Université de Montréal.
1980–84	Associate professor, Département de sciences biologiques, Université de Montréal.
1980	Professor, Département de physique, Université du Québec à Montréal.
1973–80	Research director, Centre de recherche en sciences de l'environnement, Université du Québec à Montréal. NSERC Research Associate, 1977–1980.
1972–73	Research associate, Centre de recherche écologique, Université du Québec à Montréal.
1971–72	Postdoctoral fellow (CNRC), Genetiska Institutionen, Lunds Universitet, Sweden.

Scientific interests

Pierre Legendre is an ecologist, Emeritus Professor at Université de Montréal (Canada). In 1975, he founded the field of *Numerical ecology*, which is a quantitative subdiscipline of community ecology, with his brother the oceanographer Louis Legendre. He made major contributions to that field during the past 50 years. His research focuses in particular on the ecological and biogeographical processes that generate and organise biodiversity across space and time, including beta diversity which is the variation in composition of communities of organisms across space and through time. A brief history of the development of *Numerical ecology* since its inception is recounted in an encyclopaedia article by Legendre (2019).

An important component of his research in fundamental ecology is the development of quantitative methods to analyse multivariate ecological data. An important component of his research in fundamental ecology is the development of quantitative methods to analyse multivariate ecological data. He is presently working on adapting and transferring the methods developed in spatial community ecology to landscape genetics, in particular for the study of genetic beta diversity.

2025-10-05

Scientific Prizes and Distinctions

Scientific prizes

• 2019 – Laureate of the *2019 Alexander von Humboldt Medal for Excellence in Vegetation Science* of the International Association for Vegetation Science (IAVS), *"for his valuable contributions in the field of numerical ecology"*. Medal presented on 16 July 2019 during the 62th Annual IAVS Symposium in Bremen, Germany.

• 2015 – Laureate of the *Adrien-Pouliot* Prize (for scientific cooperation with France), *Association francophone pour le savoir*[1] and the French Consulate in Québec City and Ministère des Relations internationales et de la Francophonie du Québec. Award presented in Montréal, 22 October 2015.

• 2015 – *Legend in Canadian Fisheries Science and Management* "in recognition and appreciation of contributions to fisheries science". Presented to Pierre Legendre by the *Canadian Aquatic Resources Section* of the *American Fisheries Society* (AFS), 15 May 2015. Award announced during the 145th annual conference of the AFS in Portland, Oregon, 16–20 August 2015.

• 2013 – Laureate of the Canadian Society for Ecology and Evolution (CSEE) *President's Award*. Kelowna, British Columbia, 14 May 2013, during the CSEE annual meeting.

• 2012 – Laureate of the Canadian Council of University Biology Chairs *Career Achievement Award*. University of Waterloo, 16 November 2012.

• 2005 – Laureate of *Prix Marie-Victorin*, the annual prize of the Government of Québec "*for highest achievements in research in natural sciences and engineering*". Québec, 8 November 2005.

• 1999 – Laureate of the *Twentieth Century Distinguished Service Award* "for outstanding contribution to the synergistic development and direction of statistics, ecology, environment and society", awarded by the Ninth Lukacs Symposium "*Frontiers of Environmental and Ecological Statistics for the 21st Century*". Bowling Green State University, Bowling Green, Ohio, 24 April 1999.

• 1995 – Laureate (2nd recipient) of the Romanowski Medal (environmental science) of the *Royal Society of Canada*. Saint Paul University, Ottawa, 16 June 1995.

• 1994 – Laureate of the *Distinguished Statistical Ecologist Award* of the *International Congress of Ecology* (INTECOL). Manchester, England, 22 August 1994.

• 1986 – Laureate of the *Michel-Jurdant* prize for Environment Sciences, *Association canadienne-française pour l'avancement des sciences* (Acfas)[1]. Montréal, 12 May 1986.

Teaching prizes

• 2011 – Laureate of Université de Montréal *Excellence in Teaching Award*, *Full Professor* category. Award presented on 27 May 2011.

• 2011 – Laureate of the *Excellence in Teaching Award, Science Sector* of the Faculty of Arts and Science, Université de Montréal. Award presented on 14 June 2011.

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[1] Acfas was formerly called *Association canadienne-française pour l'avancement des sciences*; despite its new name, the Society kept the acronym Acfas.

Other distinctions

• 2025 – *Ranking 1ˢᵗ among ecologists worldwide* for number of peer citations in the fields of *Beta diversity*, *Community ecology*, *Multivariate statistics*, *Numerical ecology* and *Quantitative ecology*. https://scholar.google.com/citations?user=daJE-XsAAAAJ&hl=en

• 2025 – *Emeritus Professor*, Département de sciences biologiques, Université de Montréal, Canada

• 2021 – *Member of the Order of Canada*, 24 Septembre 2021. Web page of the announcement: https://www.gg.ca/en/activities/2021/governor-general-announces-135-new-appointments-order-canada

• *Web of Science Highly Cited Researcher* in the nine lists published during 21 years, firstly in 2001, then in the years 2014 to 2021, at first by the Institute for Scientific Information (USA), then by Thomson Reuters (USA) and, since 2017, by Clarivate (USA and UK). No HCR lists were published from 2002 to 2013.

• 2019 – *Honorary life membership* in the Sociedad Ibérica de Ecología, a new scientific society which includes ecologists from the whole Iberian Peninsula. In Barcelona, 7 February 2019.

• 2016 – Elected *Corresponding Member* of Academia Mexicana de Ciencias, 5 February 2016. Officially inducted in México City on 6 March 2018.

• 2007 – Officer of the *National Order of Québec*. Presentation of insignia: Québec, 18 June 2008.

• 1992 – Elected *Fellow of the Royal Society of Canada (Academy of Science)*. Presentation of insignia: Ottawa, 21 May 1992.

• 1989-1991 – *Killam Research Fellow*, Canada Council for the Arts.

Scientific production in career

TYPES OF PRODUCTION	TOTAL NUMBER
Number of books and chapters	14 books / 22 book chapters
Number of refereed articles	Journal articles: 330 Conference proceedings and data papers: 24
Number of citations	Web of Science: 68 649 / Google Scholar: 214 612
Hirsch (h) index	Web of Science: 88 / Google Scholar: 131
Package versions in R language	131 version of 9 different R packages, available on https://cran.r-project.org
Papers at conferences	308 (including 58 keynote addresses)
Research seminars	367
Short courses	87 (in 56 universities and research institutes located in 19 countries)
International working groups	19

Publications (in chronological order)

1. Books

1.1 Legendre, L. & P. Legendre. 1979. Écologie numérique. Tome 1: Le traitement multiple des données écologiques. Collection d'Écologie no 12. Masson, Paris et les Presses de l'Université du Québec. xiv + 197 p.

1.2 Legendre, L. & P. Legendre. 1979. Écologie numérique. Tome 2: La structure des données écologiques. Collection d'Écologie no 13. Masson, Paris et les Presses de l'Université du Québec. viii + 254 p.

1.3 Legendre, L. & P. Legendre. 1983. Numerical ecology. Developments in environmental modelling, 3. Elsevier Scientific Publ. Co., Amsterdam, Netherlands. xvi + 419 pp.

1.4 Legendre, L. & P. Legendre. 1984. Écologie numérique, deuxième édition revue et augmentée. Tome 1: Le traitement multiple des données écologiques. Masson, Paris et les Presses de l'Université du Québec. xv + 260 p.

1.5 Legendre, L. & P. Legendre. 1984. Écologie numérique, deuxième édition revue et augmentée. Tome 2: La structure des données écologiques. Masson, Paris et les Presses de l'Université du Québec. viii + 335 p.

1.6 Legendre, P. & L. Legendre [eds.] 1987. Developments in numerical ecology. NATO ASI series, Vol. G-14. Springer-Verlag, Berlin. xi + 585 pp.

1.7 Legendre, P. & L. Legendre. 1998. Numerical ecology, 2nd English edition. Elsevier Science BV, Amsterdam. xv + 853 pp.

1.8 Borcard, D., F. Gillet & P. Legendre. 2011. Numerical ecology with R. Use R! series, Springer Science, New York. xi + 306 pp. (Published 20 January 2011.)

1.9 Legendre, P. & L. Legendre. 2012. Numerical ecology, 3rd English edition. Developments in Environmental Modelling, Vol. 24. Elsevier Science BV, Amsterdam. xiv + 990 pp.

1.10 Borcard, D., F. Gillet & P. Legendre. 2014. *Numerical ecology with R, Chinese edition* (translation : J. Lai, Institute of Botany, Chinese Academy of Sciences). Higher Education Press, Beijing. V + 275 pp. (Published 14 May 2014.)

1.11 Borcard, D., F. Gillet & P. Legendre. 2018. Numerical ecology with R, Second edition. Use R! series, Springer International Publishing AG. xv + 435 pp. (Published 20 March 2018.)

1.12 Borcard, D., F. Gillet & P. Legendre. 2020. *Numerical ecology with R, 2nd Chinese edition* (translation: J. Lai, Institute of Botany, Chinese Academy of Sciences). Higher Education Press, Beijing. xviii + 432 pp. + 10 colour figures. (Published 9 May 2020.)

1.13 Borcard, D., F. Gillet & P. Legendre. 2023. Numerical ecology with R (Rによる数 値生態学), *Japanese edition*. Kyoritsu Shuppan Co. Ltd, Tokyo. xvi + 494 pp. (Published 28 February 2023.)

1.14   Borcard, D., F. Gillet et <u>P. Legendre</u>. 2025. *L'écologie numérique en R*. Les Presses et l'Université de Montréal. xii + 500 p. (Parution 8 septembre 2025.)

2. Refereed book chapters

2.1   Legendre, L. & <u>P. Legendre</u>. 1978. Associations. Pp. 261-272 in: Phytoplankton Manual. Monographs on oceanographic methodology no 6. UNESCO, Paris. 338 pp.

2.2   <u>Legendre, P</u>. & L. Legendre. 1982. Échantillonnage et traitement des données. Ch. 3 (pp. 163-216) <u>in</u>: S. Frontier [éd.] Stratégies d'échantillonnage en écologie. Collection d'Écologie no 16. Masson, Paris. xviii + 494 p.

2.3   <u>Legendre, P</u>. 1983. Numerical ecology: developments and recent trends. 505-523 <u>in</u>: J. Felsenstein [ed.] Numerical taxonomy. Nato Advanced Study Institute Series G (Ecological Sciences), No. 1. x + 644 p. [Invited paper.]

2.4   <u>Legendre, P</u>. 1987. Constrained clustering. Pp. 289-307 <u>in</u>: P. Legendre & L. Legendre [eds.] Developments in numerical ecology. NATO ASI series, Vol. G-14. Springer-Verlag, Berlin. xi + 585 pages. [Invited paper.]

2.5   <u>Legendre, P.</u> 1990. Quantitative methods and biogeographic analysis. Pp. 9-34 in: Garbary, D. J. & G. R. South (eds.) Evolutionary biogeography of the marine algae of the North Atlantic. NATO ASI Series, Vol. G 22. Springer-Verlag, Berlin.

2.6   Lapointe, F.-J. & <u>P. Legendre</u>. 1996. Evolution of the marsupial brain: Does it reflect the evolution of behavior? Chapter 11, pp. 187-212 *in*: Animals and their environment – A tribute to Paul Pirlot (T. Cabana, editor). Éditions Orbis Publishing, Frelighsburg, Canada.

2.7   Renaud, J. & <u>P. Legendre</u>. 1997. Nouveaux immigrants et localisation résidentielle. P. 103–127 *in:* D. Meintel, V. Piché, D. Juteau et S. Fortin [éds.] Le quartier Côte-des-Neiges à Montréal – Les interfaces de la pluriethnicité. L'Harmattan, Paris. 323 p.

2.8   <u>Legendre, P.</u> et D. Borcard. 2006. Quelles sont les échelles spatiales importantes dans un écosystème ? Chapitre 19 (p. 425-442) *in*: J.-J. Droesbeke, M. Lejeune et G. Saporta (éds), *Analyse statistique de données spatiales.* Éditions TECHNIP, Paris. 468 pages. ISBN 10 : 2710808730.

2.9   Makarenkov, V., D. Kevorkov & <u>P. Legendre</u>. 2006. Phylogenetic network construction approaches. Pp. 61-97 in: *Applied Mycology and Biotechnology, Volume 6: Bioinformatics*. Elsevier Science B. V., Amsterdam.

2.10   <u>Legendre, P.</u> 2007. Préface. Pp. III-IV *in*: Scherrer, B. *Biostatistique*. Chenelière Éducation, Montréal.

2.11   <u>Legendre, P.</u> 2010. Coefficient of concordance. Pp. 164-169 in: *Encyclopedia of Research Design, Vol. 1.* N. J. Salkind, ed. SAGE Publications, Inc., Los Angeles. 1776 pp. ISBN: 9781412961271. [Published in July 2010.]

2.12   <u>Legendre, P.</u> & H. J. B. Birks. 2012. Clustering and partitioning. Chapter 7, pp. 167-200 in: *Tracking Environmental Change using Lake Sediments, Volume 5: Data handling and*

numerical techniques. H. J. B. Birks, A. F. Lotter, S. Juggins & J. P. Smol [eds.]. Springer, Dordrecht, The Netherlands. xi + 716 pp. [Published April 8, 2012.]

2.13 Legendre, P. & H. J. B. Birks. 2012. From classical to canonical ordination. Chapter 8, pp. 201-248 in: *Tracking Environmental Change using Lake Sediments, Volume 5: Data handling and numerical techniques.* H. J. B. Birks, A. F. Lotter, S. Juggins & J. P. Smol [eds.]. Springer, Dordrecht, The Netherlands. xi + 716 pp. [Published April 8, 2012.]

2.14 Fortin, M.-J., P. Drapeau & P. Legendre. 2012. Spatial autocorrelation and sampling design in plant ecology. Pp. 209-222 *in*: G. Grabherr, L. Mucina, M.B. Dale & C.J.F. ter Braak [eds.] *Progress in Theoretical Vegetation Science.* Advances in Vegetation Science, Vol. 11. Springer.

2.15 Legendre, P. 2013. Indicator species: computation. Pp. 264-268 in: *Encyclopedia of Biodiversity, 2nd edition.* Simon Levin [ed.] Academic Press, Waltham, MA, USA. [Published February 21, 2013.]

2.16 Boc, A., P. Legendre & V. Makarenkov. 2013. An efficient algorithm for the detection and classification of horizontal gene transfer events and identification of mosaic genes. Pp. 253-260 *in*: B. Lausen, D. Van den Poel & A. Ultsch [eds] *Algorithms from and for Nature and Life: Classification and data analysis.* Springer International Publishing, Switzerland. [Published September 10, 2013] doi:10.1007/978-3-319-00035-0_25.

2.17 Makarenkov, V., A. Boc & P. Legendre. 2014. A new algorithm for inferring hybridization events based on the detection of horizontal gene transfers. Pp. 273–293 *in*: F. Aleskerov, B. Goldengorin & P. M. Pardalos [eds.] *Clusters, Orders, and Trees: Methods and Applications — In Honor of Boris Mirkin's 70th Birthday.* Springer Optimization and Its Applications, 92. Springer, New York.

2.18 Legendre, P. 2019. Numerical ecology. Pp. 487-493 in: *Encyclopedia of Ecology, 2nd edition* (B. D. Fath, Editor-in-Chief). Volume: *Earth systems and environmental sciences.* Elsevier Inc., Oxford, England. https://doi.org/10.1016/B978-0-12-409548-9.10595-0. View the pdf: http://www.numericalecology.com/Reprints/Legendre_Numerical_Ecology_EoE2_2019.pdf

2.19 Legendre, P. 2019. Foreword. Pp. xi–xvi *in*: Griffith, D. A., Y. Chun & B. Li, foreword by P. Legendre. *Spatial regression analysis using eigenvector spatial filtering.* Elsevier Science BV / Academic Press, Amsterdam. ISBN 978-0-12-815043-6. In press (proofs corrected on 10 April 2019).

2.20 Legendre, P. 2020. The development of Numerical Ecology in China, an example of international scientific cooperation. Foreword to *Numerical ecology with R, 2nd Chinese edition* by D. Borcard, F. Gillet & P. Legendre (translation: J. Lai, Institute of Botany, Chinese Academy of Sciences). Higher Education Press, Beijing. (Published 9 May 2020).
[Foreword Chinese title: 前言 – 中国数字生态学的发展，国际科学合作的一个例子.]

2.21 Legendre, P. 2022. Coefficient of concordance. Revised version for: *Encyclopedia of Research Design, 2nd edition.* Bruce B. Frey, ed. SAGE Publications, Inc., Los Angeles. 7 pages. https://dx.doi.org/10.4135/9781071812082.n89.

2.22 Legendre, P. 2023. Indicator species: computation. Pp. 533–538 in: *Encyclopedia of Biodiversity, 3rd edition*, Volume 5. Paulo R. Guimarães Jr. / Samuel M. Scheiner [eds.] Elsevier Ltd, Oxford, England.

3. Papers published in refereed journals

A complete list, with pdf reprints, of published peer-reviewed papers are available from –
http:/numericalecology.com/Reprints/

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