

Bérangère Leys

Kansas State University

Department of Geography, 118 Seaton Hall
Manhattan, KS, 66506-2204, USA

berangereleys@gmail.com

<http://berangereleys.weebly.com/>

Education

PhD in Ecology – Biodiversity and fire ecology **2012**

Ecole Pratique des Hautes Etudes- Université Paris 1 La Sorbonne (Paris, France)

“Major driving force of vegetation dynamics in Alpine and Mediterranean mountain area during the Holocene: fire and climate.” Adv. Pr. Christopher Carcaillet.

M. Sc. Environment and Biodiversity Management- Tropical ecology **2009**

Ecole Pratique des Hautes Etudes- Université Paris 1 La Sorbonne (Paris, France)

“Tropical tree cover density measured by LAI and recorded by phytoliths.” Adv. Dr. Charly Favier and Dr. Laurent Bremond

M. Sc. Biology, Geology and scientific communication **2008**

Université Paris 7 Denis Diderot (Paris, France)

Admission for teaching in Natural Sciences (Biology, Ecology, Evolution and Geology) *via* the national French competitive exam.

B. Sc. Biological and Geological sciences – speciality in teaching activities **2007**

Université Paris 7 Denis Diderot (Paris, France)

Didactic Bachelor’s thesis: The complex and interrelated relationship teacher-student. Supervisors: Pr. Alain Tassel and Mme Skurnick.

Research experiences

2014-present Postdoctoral fellow - Disturbances and Ecosystem responses

Kansas State University (Kansas, USA)

Supervisor Dr. Kendra McLauchlan

Topic Biogeochemical consequences of ecosystem change at decadal to millennial timescales. (National Science Foundation, <http://novusrcn.wordpress.com/>)

2013-2014 Postdoctoral fellow - Community Ecology

Centre of Evolution and Functional Ecology (Montpellier, France)

Supervisors Dr. Isabelle Chuine and Dr. Xavier Morin

Topic Distribution of key-species in Mediterranean and Alpine area in response to climate and other environmental constraints (elevation, soil, competition)

Publications

Peer-reviewed articles (ISI):

- Leys B.**, Commerford J.L., McLauchlan K.K. (under review) Reconstructing grassland fire history using sedimentary charcoal: considering count, size and shape. **Plos ONE**
- Leys B.**, Higuera P, McLauchlan K.K. (2016) Wildfires drive geochemical change in a subalpine forest over the past six millennia. **Environmental Research Letters**, 11 (12), 125003.
- Leys B.**, Likens G. E., Johnson C. E., Craine J. M., Lacroix B. and McLauchlan K. K. (2016) Natural and anthropogenic drivers of calcium depletion in a northern forest during the last millennium. **Proceedings of the National Academy of Science**, 113(25), 6934-6938.
- Leys B.** and Carcaillet C. (2016) Subalpine fires in the Alps for the past 8000 years: the roles of vegetation, climate and, ultimately, land uses. **Climatic Change**, 135, 683-697.
- Vannièrè B., Blarquez O., Rius D., Doyen E., Brücher T., Colombaroli D., Connor S., Feurdean A., Hickler T., Lemmen C., **Leys B.**, Massa C. and Olofsson J. (2016) 7000-year human legacy of elevation-dependent European fire regimes. **Quaternary Science Reviews** 132, 206-212.
- Commerford J., **Leys B.**, Mueller J. and McLauchlan K. (2016) Great Plains vegetation dynamics in response to fire and drought episodes during the Holocene at Fox Lake, Minnesota, USA. **The Holocene**, 26 (2) 302-313.
- Leys B.**, Brewer C.S., Mueller J., McConaghy S. and McLauchlan K.K. (2015) Fire history reconstruction in grassland ecosystems: charcoal amount reflects the local area burned. **Environmental Research Letters**, 10 (11), 114009.
- Leys B.**, Carcaillet C., Blarquez O., Lami A., Musazzi S. and Trevisan R. (2014) Resistance of mixed subalpine forest to fire frequency changes: the ecological function of dwarf pine (*Pinus mugo* ssp. *mugo*). **Quaternary Science Reviews**, 90(0), 60-68.
- Leys B.**, Finsinger W. and Carcaillet C. (2014) Historical range of fire frequency is not the Achilles' heel of the Corsican black pine ecosystem. **Journal of Ecology**, 102(2), 381-395.
- Leys B.**, Carcaillet C., Dezileau L., Ali A. A. and Bradshaw H.W.R. (2013) A comparison of charcoal measurements for reconstruction of Mediterranean paleo-fire frequency in the mountain of Corsica. **Quaternary Research**, 79, 337-349.
- Blarquez O., Girardin M., **Leys B.**, Ali A. A., Aleman J., Bergeron Y. and Carcaillet C. (2013) Reconstruction of paleo-fire based on an ensemble-member strategy applied to sedimentary charcoal. **Geographical Research Letters**, 40, 2667-2672.
- Aleman J., Saint-Jean A., **Leys B.**, Carcaillet C., Favier C. and Bremond L. (2013) Estimating phytolith influx in lake sediments. **Quaternary Research**, 80, 341-347.
- Aleman J., **Leys B.**, Apema R., Bentaleb I., Dubois M. A., Lamba B., Lebamba J., Martin C., Ngomanda A., Truc L., Yangakola J-M., Favier C. and Bremond L. (2012) Reconstructing savannah tree cover from pollen, phytoliths and stable carbon isotopes. **Journal of Vegetation Science**, 23, 187-197.

Other published articles:

- Christopher Carcaillet et **Béragère Leys** Une intime relation lie le feu et la forêt corse depuis plus de 11000 ans. Published in Feu et foret en Corse, ed. Stantari, 2012.

Teaching and Mentoring activities

Kansas State University (Kansas, USA)

2015-2016 Mentoring of 2 undergraduate students, one Master student, and one PhD student. Projects related to grassland vegetation composition and fire history.

Université Montpellier 2 (Montpellier, France)

2013-2014 Lecturer for undergraduate and graduate students

- Geosciences class: Mediterranean environment, Biodiversity and crisis, Life history reconstruction, soil-organism interactions.
- Biology/Ecology class: Biodiversity and sustainable development, plant and animal biology, plant evolutionary, Functional ecology, human functions (nutrition, respiration...).

2009-2012 Teaching assistant

- Geosciences class: Mediterranean environment, Biodiversity and crisis.
- Biology/Ecology class: Biodiversity and sustainable development, plant and animal biology, plant evolutionary, Functional ecology.

2011 Mentoring of three undergraduate students

- Small independent research projects on ecological topics

2009 Creation and development of a course for undergraduate students: Biodiversity and Sustainable development (Lectures, fields, lab, exercises and exams)

Fellowships, Grants and Awards

2017 – PAGES meeting support. Financial support to attend to the Open Science Meeting organized by PAGES in May 2017 in Saragosa, Spain (750€).

2016 – National Science Foundation (U.S.). Collaborative Research: SG: Fire, climate, and vegetation change in an oak savanna ecosystem from annual to millennial time scales. PI: Kendra McLaughlan, co-PI: Daniel Griffin, Senior Personnel: Berangere Leys, Peter Reich, and Sarah Hobbie (\$150,000)

2016 – Travel Grant, awarded by Kansas State Advancement of Women in Science and Engineering, Kansas State University for a poster presentation at the 24th Biennial meeting of the American Quaternary Association (\$500)

2015-2016 – Open Access Publishing Fund, awarded by the Hale Library of Kansas State University (\$2,080 twice)

2015 - Travel Grant, awarded for the Preparing for an Academic Career in the Geosciences workshop, Madison, WI, USA (\$275)

2014 - Travel Grant, awarded by Tassoni grant (Italy) for the European Palaeobotany and Palynology Conference 2014 (300€).

2013-2014 - Post-doctoral Fellowship, Centre of Functional Ecology and Evolution (CEFE) and Université Montpellier II, Montpellier, France. (20,000€)

2009-2012 - 3-year Doctoral Fellowship, awarded by the French Ministry of Education and Research. (60,000€)

2010 –Training grant for R software formation (advanced ADE 4 package), Lyon, France, awarded by the Ecole Pratique des Hautes Etudes (2,000€)

2009 - 4-month Merit Scholarship, awarded by the National Centre of Scientific Research (CNRS), France (April to July, 2000€)

Conferences, Workshops and Seminars

Invited Colloquia

Kansas State University – 2017 (Manhattan, KS, USA). Fire in grassland systems: millennial time scale of fire history reconstruction and consequences on nutrient cycling. Department of Biology, seminar in Ecology and Evolutionary Biology.

University of Oregon – 2016 (Eugene, OR, USA). Consequences of nutrient cycling on dynamics of vegetation at millennial time scale. Department of Geography, Environmental Change Research Group.

Kansas State University – 2015 (Manhattan, KS, USA). Use of handheld XRF and XRD techniques to assess long-term nutrient dynamics from lake sediment of Mirror Lake, NH. Department of Geology.

University of Utah - 2015 (Salt Lake City, UT, USA). Long-term fire ecology: processes and consequences on ecosystems. Department of Geography.

Centre of Functional and Evolutionary Ecology - 2014 (CEFE-CNRS, Montpellier, France). Alpine and Mediterranean paleo-fires: human- or climate-induced disturbance? Department of Functional Ecology.

Contributed Conferences

American Quaternary Association – 2016 (Santa Fe, New Mexico, USA) Leys B, Brewer C.S., Mueller J., McConaghy S., McLauchlan K.K., and Marlon J. Fire history reconstruction in Grassland ecosystems.

Ecological Society of America - 2015 (ESA, Baltimore, Maryland, USA) Leys B., Brewer S., Mueller J. McConaghy S. and McLauchlan K. Calibration of charcoal measurements for fire history reconstruction in grassland ecosystem.

European Palaeobotany and Palynology Conference - 2014 (EPPC, Padova, Italy) Leys B., Finsinger W. and Carcaillet C. Historical range of fire frequency is not the Achilles' heel of the Corsican black pine ecosystem.

Models in Evolution and Ecology - 2014 (Montpellier, France, 2014) Leys B., Curt T and Elkin C. Impact of fire regime on Corsican black pine ecosystem: paleo-fire frequency reconstructed and fire behaviour modelled.

FIREMAN UE project annual meeting - 2013 (Tallberg, Sweden) Leys, B. Impact of fire regime on Corsican black pine ecosystem during the Holocene: paleoecological and modeling approaches.

Tours 2012 - 2012 (Tours, France) Leys B., Finsinger W., Carcaillet C., 18,000 years of vegetation and fire history of Mediterranean mountain of Corsica (Lac de Creno), France.

Medpine 4 - 2011 (Avignon, France) Leys B., Carcaillet C., Long term fire and vegetation histories in Mediterranean mountain of Corsica, France.

Ecoveg 7 - 2011 (Lausanne, Switzerland) Leys B., Carcaillet C. Histoire des feux et de la biodiversité végétale méditerranéenne: étude d'un lac montagnard Corse.

GMPCA - 2009 (Montpellier, France) Leys B., Bremond L. et Favier C. Densité du couvert arboré tropical mesurée par l'indice foliaire et enregistrée par les phytolithes.

Workshop organizer

Weekly meetings of the Paleo-environmental laboratory, at Kansas State University, KS, USA (Fall semester session 2016)

- 10 meetings, including one CV workshop and 6 talks by invited researchers.

Novus workshop 3, at Cedar Creek Ecosystem Science Reserve and at the University of Minnesota, MN, USA (15-22 May 2016)

- 28 participants from five different nations, decision committee for five travel grants and diffusion of the workshop announcement in European and US networks.

Seminar for PhD students of Ecole Pratique des Hautes Etudes (EPHE), at Montpellier (11-12 April 2010)

- 26 participants, including the Dean and the Head of the Life and Earth section.

Workshop participant

“Fire history baselines by biome”, PAGES (Past Global Changes) workshop for the Global Paleofire Working Group 2, at Université of Bordeaux, France (26-30 Sept 2016)

“Hubbard Brook Ecosystem Study annual meeting”, Woodstock, NH (8-9 July 2015)

“Funding Opportunities: the Art of Grantmanship”, Manhattan KS (5 February 2015)

“Preparing for an Academic Career in the Geosciences”, Madison WI (31 May-3 June 2015)

“Preparing a Job Interview”, Manhattan KS (10 November 2015)

“Grant writing”, Manhattan KS (24-25 February 2016)

Academic Services and Outreach

Journal referee for *Journal of Ecology*, *Global Ecology and Biogeography*, *Biogeosciences*, *Quaternary Science Reviews*, *Quaternary International*, *Forests*, *Canadian Journal of Forest Research*, and *Scandinavian Journal of Forest Research*.

Key participant of Forest Dynamics, PAGES (Past Global Changes) working group, 2016-current

Volunteer for the burning season 2016 at Konza Prairie Biological Station, Manhattan, KS.

Steering committee member of the Novus Research Coordination Network (National Science Foundation grant) 2014-2016.

Decision-making committee to award 9 grants for the Scientific Exchange Program of the Novus Research Coordination Network, November 2014.

Professional memberships in the French Ecological Society (SFE), and the American Quaternary Association (AMQUA).

Open House for Kansas State University and Université Montpellier 2.

Elected representative of PhD students, EPHE (2010-2012) to (i) have a seat in the disciplinary council, (ii) satisfactory survey and (iii) seminar organisation.

Scientific popularization by Career Chat and postdoc appreciation week meetings organized by Kansas State Association of Women in Sciences and Engineering. Science Bar sessions (public) and open exchange with high school students about woman in science and the role of the university in their formation, both organized by Connaisciences.

Specific Skills

Laboratory and fieldwork skills

Fieldwork skills: Lead field teams, lake, tree and soil coring, sediment sampling, plant macroremain identification, charcoal extraction and identification.

Data analyses: big data set, charcoals, plant macroremains, pollen, isotopes and elements.

Sedimentology: ^{210}Pb , ^{137}Cs , ^{14}C techniques, loss-on-ignition, particle sizes, magnetic

susceptibility, X-Ray techniques (fluorescence and diffraction).

Computer skills

Statistical tools: R software and packages and Matlab (MCAgeDepth, Charanalysis, and SEA)

Models: LASS (Landscape Analysis and Simulation Shell software on R), ForClim (capsis 4 platform), Phenofit and PMP (Phenology Modelling Platform)

Specialized software: WindSeedle (image analyser for charcoal particles), HighPeak (XRD peak identification), Bruker Handheld XRF Tracer 3 SD software (voltage, control and calibration of the Bruker Handheld XRF tracer 3 SD), CANOCO (multivariate analyses for pollen data, including DCCA), Tilia (plot pollen data).

Databases: user and/or contributor to the Global Charcoal Database, NEOTOMA, and NOAA datasets.

GIS: Q-GIS

OS: MacOS / Windows XP and Vista/ computer certificates c2i 1 and 2

Other: Microsoft Office package; Adobe illustrator.

Language skills

Fluent in French, English (written and spoken).

Scientific collaborations and leading skills

Mentoring of five undergraduate students, two Master students, and one PhD student. Projects related to vegetation dynamics, fire history, functional ecology, and sedimentology.

Collaboration with **12 European researchers from 8 different institutions, and 18 non-European researchers (Canada, and the United States) from 11 different institutions.**

Collaborative work with biogeochemists, modellers, geologists, terrestrial ecosystem ecologists, dendrochronologists, limnologists, or paleoecologists.

Close work with **5 institutions of land management:** in France (National Office Forestry), in Italy (Forestry officers of Paneveggio protected area), and in the United States of America (Officers of Konza Prairie Biological Station, Hubbard Brook Ecosystem Sciences; and Cedar Creek Ecosystem Science Reserve, all part of Long Term Ecological Research program).