

Curriculum vitae

VAN DER HEIJDEN Gregory

Nationality : British

Date of birth : 18/04/1986

Gender: Male

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UR 1138 Biogéochimie des Ecosystèmes Forestiers

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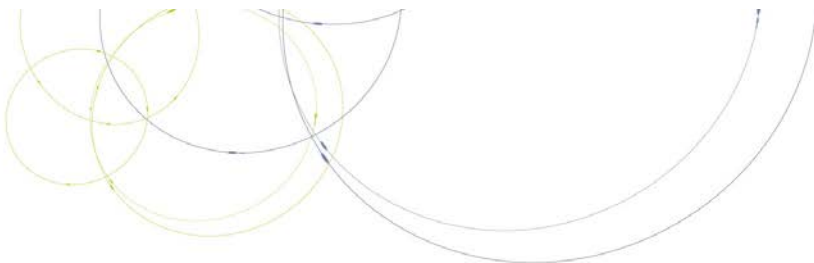
Education and training

- 2009-2013 **PhD** (04/02/2013), **Forest and soil sciences**, Agro Paris Tech
- Title: A multi-isotopic (^{26}Mg , ^{44}Ca and ^2H) tracing experiment to better understand nutrient cycling in forest ecosystems
- Supervisors: Etienne DAMBRINE (directeur de recherches) UMR-CARTELE, INRA – Université de Savoie
Arnaud LEGOUT (chargé de recherche) UR BEF, INRA de Nancy
- Laboratory: Biogéochimie des Ecosystèmes Forestiers, UR 1138, INRA de Nancy
- Funding: Contrat Jeune Scientifique (CJS-INRA)
- Jury: GEGOUT, Jean-Claude (Professor) UMR LERFoB, Agroparistech-ENGREF, Nancy
JOHNSON, Dale (Professor) University of Nevada, USA
BALESDENT, Jérôme (directeur de recherches) UR GSE, INRA Aix-en-Provence
FRANCE LANORD, Christian (directeur de recherches) CNRS-CRPG, Nancy
AUGUSTO, Laurent (chargé de recherche) UMR TCEM, INRA Bordeaux
- 2008-2009 **MSc « Water and soil management »**, Université de Lorraine, Nancy, mention « bien » (15.91/20)
- MSc thesis: Modeling the response of a fir tree stand on a base-poor soil in the Vosges Mountains (France) to atmospheric deposition and silviculture change
- 2006-2009 **Forestry engineering degree**, AgroParisTech-ENGREF centre de Nancy (Formation des Ingénieurs Forestiers)
- 2004-2006 Two year preparation course for the competitive examination (classe préparatoire aux grandes écoles) in Biology, Chemistry, Physics and Geology (BCPST-véto), Lycée Malherbe, Caen, France.
- 2004 **Baccalauréat**, Scientific section, specialty biology, Mention « très bien » (16.10/20).

Work experience

Research activities

- 2013-2014 **Post-doctoral position at the Centre for Environmental and Climate research, Lund University (Sweden)**. *Modeling the isotopic dilution and isotopic tracer fluxes (^{26}Mg et ^{44}Ca) in the beech plot of the Breuil-Chenu experimental site (Burgundy, France) with the ForSAFE model*, Collaboration with Salim Belyazid and Harald Sverdrup. **Funding INRA-CJS**



- 2011 Invited by Dr Andrew J. Midwood, four weeks. **The James Hutton Institute, Aberdeen, Scotland, UK.** *Measuring isotope ratios $^{26}\text{Mg}/^{24}\text{Mg}$ et $^{44}\text{Ca}/^{40}\text{Ca}$ in environmental samples with ICP-MS: validating the results with an intercalibration method between two different ICP-MS instruments (Agilent et Bruker) and TIMS*
- 2011 HYDRUS-1D training course and initiation to HYDRUS-2D and HP1 « *Advanced modeling of water flow and contaminant transport in porous media using the HYDRUS and HP1 software packages* » (Pr. J. Šimůnek) March 22nd to 24th 2011, Czech University of Life Sciences, Prague, Czech Republic
- 2009-2013 **PhD (04/02/2013) at the INRA, Nancy**, supervised by Etienne Dambrine (directeur de recherche INRA) and Arnaud Legout (chargé de recherche INRA): *A multi-isotopic (^{26}Mg , ^{44}Ca and ^2H) tracing experiment to better understand nutrient cycling in forest ecosystems.* **Funding INRA-CJS.**
- 2009 Invited by Dr Andrew J. Midwood, four weeks. **The James Hutton Institute, Aberdeen, Scotland, UK.** *Training course for isotopic ratio analysis ($^{26}\text{Mg}/^{24}\text{Mg}$ and $^{44}\text{Ca}/^{40}\text{Ca}$) in environmental samples with ICP-MS.*
- 2009 **MSc thesis**, January to June, **at the INRA, Nancy**, supervised by Etienne Dambrine : *Modeling the response of a fir tree stand on a base-poor soil in the Vosges Mountains (France) to atmospheric deposition and silviculture change*
- 2008 **MSc student internship** July and August, at the **National Research Centre (CNR)** in Florence (Italy) at the Ivalsa Trees and Timber Institute (Ivalsa) supervised by Raffaele Spinelli: *Forest harvesting mechanization, a tool to make the first stand thinnings profitable in beech stands in the Apennine Mountains.*

Teaching

- 2012 Invited lecturer (October), 7h, *Forest nutrition and sustainable development* (Dr. Bernard Jabiol) Forest engineer formation, Agro Paris Tech, Nancy, France), 3h lecture and 4h field work
- Invited lecturer (September), 2h, *Unconventionnal isotopes in environmental studies* (Dr. Daniel Epron, level PhD, SIBAE COST, ETH Zürich)
- 2011 Invited lecturer (October), 7h, *Forest nutrition and sustainable development* (Dr. Bernard Jabiol) Forest engineer formation, Agro Paris Tech, Nancy, France), 3h lecture and 4h field work
- Invited lecturer (December 2011), 3h, *Water and solutes in forest soils* (Dr. Jacques Ranger, level MSc, Forest, Agronomy and Environment, Université de Lorraine, Nancy, France)

Supervising students during internships

- 2011 MSc student (FAGE, Forest Agronomy and Environment, Université de Lorraine, Nancy), two months.
- MSc student (SEE, Soil Water and Environment, Université de Lorraine, Nancy), five months.

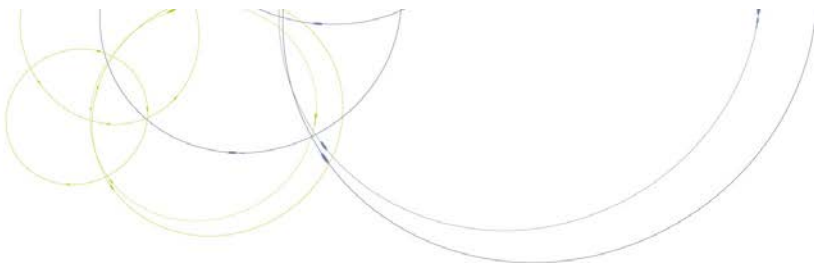
Participation in open calls for proposals as contributor or leader

Participation in the work package WP2 of the French laboratory of excellence LABEX ARBRE *Advanced research on the biology and ecology of forests* (Coordinator: Francis Martin):

Project title: Quantum Leap for Soil-Plant interaction Models (QL-SPiMs)
Coordinator: Laurent Saint-André

Participation in the ANR RECOVER (Coordinator: François Guérolde):

Project title: Axis 2. Soil chemistry and hydrology, and stream chemistry. Prediction of future variations at the limed and control catchments



Coordinator: Etienne Dambrine

Participation in the Zone Atelier Moselle (ZAM) convention:

Project title: *Natural or anthropique restauration of streams in the Vosges Mountains acidified in the 1970s and 1980s*
Coordinator: Arnaud Legout

Skills

Techniques *in situ* isotopic tracing (^{26}Mg , ^{44}Ca , ^2H), *in situ* and *ex situ* expérimental design, field measurements in forest ecosystems (soils, solutions, vegetation), **chemical element analysis** in solid and liquid phase (cations, anions, carbone, nitrogen, pH), **isotopic ratio analysis and method development** (ICP-MS and TIMS), **modeling** with existing models (Biljou, Hydrus-1D, Profile, NuCM) and model development.

Informatique SAS, R statistic, XL-Stat, VB-Excel, Matlab, ArcGIS, Microsoft Office (Word, Excel, Powerpoint, Access).

Languages

Mother tongue Other languages <i>European level</i>	English				
	Understanding		Speaking		Writing
	Listening	Reading	Spoken interaction	Spoken production	
French	C2	C2	C2	C2	C2
Italian	B2	B1	B1	B1	B1
Swedish	A1	A1	A1	A1	A1

Academic record

Publications

Accepted, in press and published

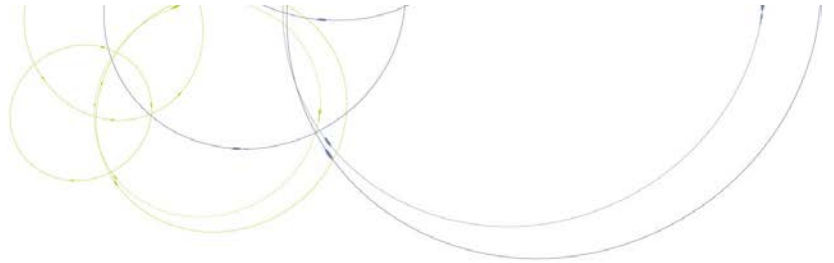
Gandois L, Nicolas M, [van der Heijden G](#) and Probst A, **2010**, "The importance of biomass net uptake for a trace metal budget in a forest stand in north-eastern France" **Science of The Total Environment** 408, 5870-5877.

[van der Heijden G](#), Legout A, Nicolas M, Ulrich E, Johnson D W and Dambrine E (**2011**) "Long-term sustainability of forest ecosystems on sandstone in the Vosges Mountains (France) facing atmospheric deposition and silvicultural change" **Forest Ecology and Management** 261, 730-740.

[van der Heijden G](#), Legout A, Midwood A, Craig C-A, Pollier B, Ranger J, Dambrine E (**2012**) "Mg and Ca root uptake and vertical transfer in soils assessed by an *in situ* ecosystem-scale multi-isotopic (^{26}Mg & ^{44}Ca) tracing experiment in a beech stand (Breuil-Chenu, France)" **Plant Soil**: 1-13.

[van der Heijden G](#), Legout A, Pollier B, Bréchet C, Ranger J, Dambrine E (**2013**) "Tracing and modeling preferential flow in a forest soil — Potential impact on nutrient leaching" **Geoderma** 195-196(0): 12-22.

[van der Heijden G](#), Legout A, Pollier B, Mareschal L, Turpault M-P, Ranger J, Dambrine E (**2013**) "Assessing Mg and Ca depletion from broadleaf forest soils and potential causes - A case study in the Morvan" **Forest Ecology and Management** 293(0): 65-78.



Submitted and in preparation

van der Heijden G, Legout A, Pollier B, Ranger J, Dambrine E (**submitted**) “Fate of calcium and magnesium rainfall inputs in a forest ecosystem on base poor soil assessed with a isotopic tracing experiment (^{26}Mg and ^{44}Ca)” **Ecosystems**.

van der Heijden G, Legout A, Pollier B, Ranger J, Dambrine E (**in preparation**) “Tracing Mg and Ca uptake and allocation in a beech stand on a base-poor soil with ^{26}Mg and ^{44}Ca ”

Communications in international conferences

van der Heijden G, Legout A, Nicolas M, Ulrich E, Johnson D W and Dambrine E “Long-term sustainability of forest soil fertility assessed by nutrient input-output budgets and a modeling approach”, **EUROSOIL 2012: Soil science for the benefit of mankind and environment**, July 2nd to 6th 2012, Bari, Italy, **poster presentation**.

van der Heijden G, Legout A, Midwood A J, Craig C A, Pollier B, Zeller B, Ranger J and Dambrine E “An in situ ecosystem-scale multi-isotopic (^{26}Mg , ^{44}Ca , ^{15}N and ^2H) tracing experiment to study nutrient fluxes in forest ecosystems”, **EUROSOIL 2012: Soil science for the benefit of mankind and environment**, July 2nd to 6th 2012, Bari, Italy, **poster presentation**.

van der Heijden G, Legout A, Pollier B, Zeller B, Ranger J and Dambrine E “An in situ ecosystem-scale multi-isotopic (^{26}Mg , ^{44}Ca , ^{15}N and ^2H) tracing experiment”, **BIOGEMON 2012: The 7th symposium on ecosystem behavior**, July 15th to 20th 2012, University of Maine, Northport, Maine, USA, **oral presentation**

Communications in national conferences

van der Heijden G, Dambrine E, Legout A, Manuel N, “Simulation des effets de différentes évolutions des dépôts atmosphériques et de la sylviculture sur la fertilité des sols et la croissance de peuplements forestiers des Vosges” **Journées Sols de montagne**, September 24th and 25th 2009, Université de Savoie, Le Bourget du Lac, France, **oral presentation**

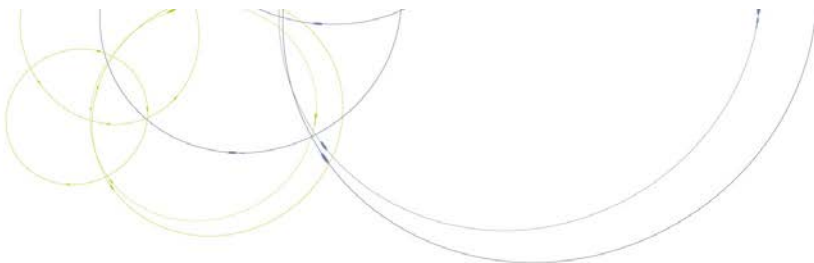
van der Heijden G, Dambrine E, Legout A, Manuel N, “Simulation des effets sur la fertilité des sols et la croissance forestière d’une évolution des dépôts atmosphériques et de la sylviculture. Conséquences sur la qualité des eaux” **Journées Zone Atelier Moselle 2009**, 29 et 30 September 29th and 30th 2009, INRA de Nancy, Champenoux, France, **oral presentation**

van der Heijden G, Legout A, Ranger J, Dambrine E “Modélisation et traçage de l’eau dans le sol d’un peuplement forestier” **10^{ème} Journées d’Etude sur les Milieux Poreux**, October 20th and 21st 2010, ENSIC, Nancy, France, **oral presentation**

van der Heijden G, Midwood A J, Craig C-A, Pollier B, Dambrine E, Legout A, “Analyse isotopique $^{26}\text{Mg}/^{24}\text{Mg}$ et $^{44}\text{Ca}/^{40}\text{Ca}$ d’échantillons environnementaux dans le cadre d’une expérience de multi-traçage isotopique – développement, intercalibration et validation de méthodes” **5^{ème} Journées SFIS des Jeunes Chercheurs**, Octobre 12th to 14th 2011, Ifremer, Brest, France, **oral presentation**

Scientific popularisation

- 2009 2009 Science festival (Fête de la Science 2009, November 22nd) “The Becoming of a drop of water in a forest catchment, from rain to stream”
- Experimentarium (Bains-les Bains, France, December) – presenting the PhD research project to primary school children (age 7-8 years’ old)



- 2010 Interview for Eureka Lorraine (Online regional news), January.
Experimentarium (Vosges, France, June) – presenting the PhD research project to primary school children (age 7-8 years' old)
Interview for France Bleue Lorraine “La minute de la Science” (regional radio broadcast), August
- 2010 2010 Science festival (Fête de la Science 2010, October 22nd and 23rd) “Open-doors days at the INRA of Nancy”
Interview for France 3 Lorraine “Midday news report” (regional television channel) during the 2010 Science festival
- 2011 Interview for France 3 Lorraine by Anne-Laure Chery, television report describing the PhD research project

Scientific references

Full name Etienne DAMBRINE
Position Professor, UMR CARRTELL (Lake hydrobiology unit)
Institution INRA – Université de Savoie
Email address etienne.dambrine@univ-savoie.fr

Full name Arnaud LEGOUT
Position PhD (Chargé de recherche), UR BEF (Forest Ecosystem Biogeochemistry)
Institution INRA
Email address legout@nancy.inra.fr

Full name Jacques RANGER
Position PhD (Directeur de recherche), UR BEF (Forest Ecosystem Biogeochemistry)
Institution INRA
Email address ranger@nancy.inra.fr