

CURRICULUM VITAE

Niklaus E. Zimmermann

1. PERSONAL DATA

Address:	Niklaus E. Zimmermann, Dr., adj. Prof. ETH Swiss Federal Research Institute WSL CH-8903 <u>Birmensdorf</u> Swiss Federal Institute of Technology (ETH)	Office	+41-44-737-2337
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		Email	niklaus.zimmermann@wsl.ch
		Email	niklausz@ethz.ch
Birth:	April 14 th 1963	h-index:	55 / 65 (WOS/Google Scholar)
Nationality:	Swiss	no of ISI-papers:	166 , of which 3 are in press
Title:	Dr. Sci. Nat., Biology	total no. citations:	17'552 / 29'911 (WOS/Google)
Languages	German, English, French	avg. citations/paper:	100.87 (WOS)
		ResearcherID:	A-4276-2008¹

2. ACADEMIC DEGREES

Masters:	1989. Botany, University of Bern, Dept. of Geobotany and Ecology, Switzerland. <i>Fraktalstufen-Vergleich zwischen Vegetation und Geomorphologie am Beispiel des Gemmipasses, VS, Schweiz</i>
Ph.D.:	1996. Botany, University of Bern, Dept. of Geobotany and Ecology, Switzerland. <i>A climatically-sensitive, spatially-explicit model for Alpine vegetation of Switzerland</i>

3. HONORS AND AWARDS

2018:	Award by Clavariate (ISI) of being one of the most cited scientists (highlycited.com) in ecology/environment
2017:	Award by Clavariate (ISI) of being one of the most cited scientists (highlycited.com) in ecology/environment
2016:	Award by Thomson Reuters (ISI) of being one of the most cited scientists (highlycited.com) in ecology/environment
2015:	Award by Thomson Reuters (ISI) of being one of the most cited scientists (highlycited.com) in ecology/environment
2014:	Award Adjunct Professor ETHZ in Macroecology
2014:	Award by Thomson Reuters (ISI) of being one of the most cited scientists (highlycited.com) in ecology/environment
2011:	Awarded Honorary Professor of the Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, China
2007:	ISI recognition for one of the "New Hot Papers" in 2003 in the field of "ecology and environmental sciences" listed in May 2007. (see http://esi-topics.com/nhp/2007/may-07-Elith_Graham.html)
2007:	ISI recognition for one of the "Fast Breaking Papers" in 2007 in the field of "ecology and environmental sciences" listed in April 2007. (see http://esi-topics.com/fbp/fbp-april2007.html)
2003:	ISI recognition for one of the "New Hot Papers" in 2003 in the field of "ecology and environmental sciences" listed in May 2003. (see http://www.esi-topics.com/nhp/2003/may-03-Guisan-Zimmermann.html)
1990:	Faculty Prize for the Master Thesis, Faculty of Natural Sciences, University of Bern, Switzerland.

4. PROFESSIONAL EXPERIENCE

2014 – present	Adjunct Professor in Macroecology at the Swiss Federal Institute of Technology (ETHZ), Zürich, ZH, Switzerland
2013 – present	Senior Scientist at the Swiss Federal Research Institute WSL, Birmensdorf, ZH, Switzerland
2007 - present	Member of the directorate of the Swiss Federal Research Institute WSL, Birmensdorf, ZH, Switzerland.
2006 - 2013	Head of the Research Unit <i>Land Use Dynamics</i> , Swiss Federal Research Institute WSL, Birmensdorf, ZH.
2001 - 2006	Associate Researcher and Project Leader, Department of Landscape Dynamics and Management, Landscape Division, Swiss Federal Research Institute WSL, Birmensdorf, ZH, Switzerland.
1999 - 2001	Postdoctoral Fellowship, Department of Landscape Inventories, Landscape Division, Swiss Federal Research Institute WSL, Birmensdorf, ZH, Switzerland.
1998 - 1999	Postdoctoral Fellowship, Department of Geography and Earth Resources, Lab for GIS and Remote Sensing, College of Natural Resources (CNR), Utah State University.
1997 - 1998	Postdoctoral Fellowship, Department of Forest Resources and Ecology Center, College of Natural Resources (CNR), Utah State University.
1996 - 1997	"Oberassistent", Department of Geobotany and Ecology, Geobotanical Institute (SGIUB), University of Bern, Switzerland.
1993 - 1996	Associate Researcher & PhD student, Department of Landscape Dynamics, Landscape Division, Swiss Federal Research Institute WSL, Birmensdorf, ZH, Switzerland.

¹ <http://www.researcherid.com/rid/A-4276-2008>

1990 - 1993 Teaching Assistant, Department of Geobotany and Ecology, Geobotanical Institute (SGIUB), University of Bern, Switzerland.

5. PROFESSIONAL AFFILIATIONS

- International Biogeography Society (IBS)
- Ecological Society of America (ESA)
- Gesellschaft für Ökologie (GfÖe)
- Swiss Botanical Society (SBG)

6. TEACHING

From 1989 to 1996 I have been teaching practical and theoretical lessons on an annual basis mainly in the domain of vegetation ecology at the University of Bern. Some of these courses I have designed myself (vegetation ecology II; concepts and theories in vegetation ecology; statistical analyses of vegetation data). Since 2000, I teach at various universities in the domain of landscape ecology and ecological modeling.

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|--|----------------------|-----------|
| • Master course: Spatial modelling: from climate & land-use to biodiversity conservation | 2016 – ongoing | ETHZ |
| • Master course: Ecosystems and climate (<i>guest lectures in English</i>) | 2016 – ongoing | UNIZH |
| • Master course: Macroecology, climate change and niche evolution (<i>German, English</i>) | 2010 – 2014 | UNIZH |
| • Master course: Advanced topics in landscape ecology (<i>German, English</i>) | 2006 – 2014 | ETHZ |
| • Master course: Plant ecology and predictive spatial modeling (<i>German, English</i>) | 2006 – 2009 | UNZH |
| • Predictive habitat distribution modeling in ecology (with A. Guisan, <i>English</i>) | WS 2007 | UHelsinki |
| • Introduction to Gap Dynamics Modelling (2 lectures annually, <i>English</i>) | SS since 2002 | UNIL |
| • Introduction to landscape ecology (with F. Kienast, <i>German</i>) | WS 2000 – 2005 | UNIBE |
| • Introduction to predictive habitat modelling in ecology (<i>German</i>) | SS 1996, 2000 – 2004 | UNIBE |
| • Concepts and theories in vegetation ecology (<i>German, English</i>) | 1996 | UNIBE |
| • Statistical analyses of vegetation data (<i>German</i>) | 1989 – 1996 | UNIBE |
| • Vegetation ecology II, for advanced students (<i>German</i>) | 1990 – 1996 | UNIBE |
| • Alpine vegetation ecology (<i>German</i>) | 1989 – 1996 | UNIBE |
| • Introduction to vegetation ecology of Switzerland (<i>German</i>) | 1989 – 1996 | UNIBE |

7. SUPERVISION AND REFEREEING OF PHD STUDENTS (LAST 10 YEARS)

Principal Responsibility for Scientific PhD & Master Supervision

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|---|---|
| Gehrig-Fasel, Jacqueline, 2002-2007. <i>Treeline and climate change: analyzing and modeling patterns and shifts in the Swiss Alps</i> . PhD Thesis at the University of Lausanne, with Prof. A. Guisan. Funding: WSL/BAFU. | Steinmann, Katharina, 2004-2008. <i>Testing basic assumptions of species richness hypotheses using plant species distribution data</i> . PhD Thesis at the University of Zürich, with Prof. P. Linder. Funding: EU-FP6 Project IntraBioDiv. |
| Rickebusch, Sophie, 2002-2006. <i>Modelling tree population dynamics at the Alpine and Boreal tree-line ecotones in response to climate and land-use change</i> . PhD Thesis at the University of Lausanne, with Prof. A. Guisan. Funding: EU-FP5 Project PINE. | Meier, Eliane Seraina, 2008-2011. <i>Modelling spatial dynamics of plant distribution – Implementation of biotic interactions and migration improves large-scale projections of species distributions during climate and land-use change</i> . PhD Thesis at the Swiss Federal Institute of Technology (ETHZ) with Prof. F. Kienast. Funding: EU-FP6 Project ECOCHANGE. |
| Rutherford, Gillian, 2002-2006. <i>The use of land-use statistics to investigate large-scale successional processes</i> . PhD Thesis at the Swiss Federal Institute of Technology (ETHZ), with Prof. P.J. Edwards. Funding: NFP48. | Lieske, Reimo, 2009-2010. <i>Modelling the potential distribution of Kt. Zürich invasive plants</i> . Master Thesis at the University of Salzburg, Austria. |
| Gellrich, Mario, 2002-2007. <i>Forest Expansion in the Swiss Alps: a quantitative analysis with an emphasis on structural change in agriculture</i> . PhD Thesis at the University of Freiburg, Germany, with Prof. B. Koch. Funding: NFP48. | Wüest, Rafael, 2007-2008. <i>Evaluating the niche stability in the genus Carex</i> . Master Thesis at the University of Zurich, with Prof. H.P. Linder. |
| Mathys, Lukas, 2004-2007. <i>A discrete Forest in a continuous Landscape - Investigating Interactions between Natural Resource Management and Sustainable Development</i> . PhD Thesis at the University of Lausanne with Prof. A. Guisan. Funding: WSL/BAFU. | Saladin, Bianca, 2012-2013. <i>Niche and trait evolution in Pinus</i> . Master Thesis at the Institute of Systematic Botany of the University of Zurich, Switzerland, with Prof. Elena Conti. |
| Psomas, Achilleas, 2004-2008. <i>Hyperspectral remote sensing for ecological analyses of grassland ecosystems – spectral separability and derivation of NPP related biophysical and biochemical parameters</i> . PhD Thesis at the University of Zürich with Prof. K. Itten. Funding: BAFU. | Saladin, Bianca, 2014-2017. <i>Effects of Climate and its Change on Phylogenetic, Functional and Species Diversity</i> . PhD Thesis at the Swiss Federal Institute of Technology (ETHZ). Funding: SNF |
| | Chauvier, Yohann, 2017-2020. <i>Optimization of plant diversity conservation in the European Alps</i> . PhD Thesis at the Swiss Federal Institute of Technology (ETHZ). Funding: SNF. |

Committee member and significant responsibility for scientific co-supervision

- Cunningham, Catherine, ETHZ, 2001-2006. *Growth of Norway spruce saplings: Exploring the influence of spring conditions through observation, experiment, and model simulation*. PhD Thesis at the Swiss Federal Institute of Technology (ETHZ) with Prof. H. Bugmann. Fundings: ETHZ.
- Stefan Leyk, WSL, 2002-2005. *Computing the past – utilizing historical data sources for map-based retrospective landscape research*. PhD Thesis at the University of Zürich with Prof. R. Weibel. Funding: BAFU.
- Silvia Huber, UNIZH, 2003-2007. *Estimation of Ecologically Relevant Land Cover Variables from Imaging Spectroscopy*. PhD Thesis at the University of Zürich with Prof. K. Itten. Funding: Swiss National Science Foundation (SNF).
- Raphael Wüest, WSL, 2009-2012. *Niche evolution in Southern Hemisphere Graminoid species*. PhD Thesis at the University of Zürich with Prof. H.P. Linder. Funding: SNF-Sinergia.
- Desalegn Chalete, Univ. Oslo, 2011-2015. *Climate change and niche evolution in the African High Mountain Flora – Implications for adaptation to climate change*. PhD Thesis at the University of Oslo with Prof. C. Brochmann.
- Christin Loran, ETHZ Zürich, 2015-2018. *Exploring long-term forest cover change and its driving forces in Switzerland (1850-2000)*. PhD Thesis at ETHZ Zürich with Prof. F. Kienast.
- Damiano Righetti, ETHZ Zürich, 2014-2018. *Relationships between global patterns in marine phytoplankton diversity and ecosystem functions*. PhD Thesis at ETHZ Zürich with Prof. N. Gruber.
- Hamid Taleshi, Univ. Tarbiat Modares, 2015-2018. *Climate Change Impacts on Tree Species Distribution in Central Hyrcanian Forests of Iran*. PhD Thesis at University of Tarbiat Modares, Iran.
- Jens Ringelberg, Univ. Zürich, 2015-2019. *Climate-niche evolution and relationships in Mimosoideae*. PhD Thesis at the University of Zürich with Prof. C. Hughes. Funding: Swiss National Science Foundation (SNF).
- Victoria Cabrera, Univ. Zürich, 2015-2019. *Unravelling ecological and macroevolutionary drivers of the evolution of biodiversity in *Lupinus**. PhD Thesis at the University of Zürich with Prof. C. Hughes. Funding: Swiss National Science Foundation (SNF).

Committee member with no major co-supervision

PHD THESES: K. Patraw Van Niel (Univ. Canberra, 2003); N Wyler (Univ. Geneva, 2003); O. Broennimann (Univ. Lausanne, 2008); V. Bakkestuen (Univ. Oslo, 2009); C. Albert (Univ. Grenoble, 2009); J. Sarmiento Cabral (Univ. Potsdam, 2010); J. Hanspach (Univ. Halle, 2010); S. Normand (Univ. Aarhus, 2010); R. Maggini (Univ. Lausanne, 2011); C. Piedallu (Univ. Nancy, 2011); I. Boulangeat (Univ. Grenoble, 2012); Mirjam Pfeiffer (EPFL, Lausanne, 2013); Patricia R. Sutcliffe (Univ. Queensland, 2013), Bente Støa (Univ. Oslo, 2014), Bradley Z. Carlson (Univ. Grenoble, 2016), Anna Weigand (Univ. Zürich, 2017), Charles D Clark (Victoria Univ. Wellington, 2017), Jan Smycka (Univ. Grenoble, 2019).

MSC THESES: R. Engler (Univ. Lausanne, 2004); L. DiStefani (Univ. Lausanne, 2004); R. Milleret (Univ. Lausanne, 2004); G. Vuissoz (Univ. Lausanne, 2005); F. Dessimoz (Univ. Lausanne, 2006); E. Franc (Univ. Lausanne, 2006); L. Rohrer (ETHZ, 2006); S. Vissault (Univ. Quebec, Rimouski, 2016)

8. MAJOR RESEARCH PROJECTS (LAST 10 YEARS)

- 2017 – 2019 **SPEEDMIND**. SDSC/ETH Domain. *Improving species biodiversity analyses and citizen science feedback through mining data*. Funded budget is CHF 307'000.-, NE Zimmermann is PI.
- 2017 – 2020 **ORIGIN-ALP**. SNF/ANR Funded Swiss-French Research Project. *Origin, assembly and conservation of plant diversity in the European Alps*. Funded budget is CHF 868'000.-; ANR-funded part with S. Lavergne/W. Thuiller is 365'000.-, SNF-funded part for WSL is CHF 503'000.-, NE Zimmermann is PI.
- 2016 – 2017 **PorTree+**. BAFU-WSL Project. *Improving tree species distribution models and mapping analogue/non-analogue future climates in current Europe*. Funded budget is CHF 29'000.-, NE Zimmermann is PI.
- 2015 – 2019 **STACCATO**. Biodiversa/SNF-funded research project. *Sustaining agricultural change through ecological engineering and optimal use of natural resources*. Funded Budget is 3 Mio €. NE Zimmermann is WP leader and WSL lead scientist. WSL share is CHF 240'000.-
- 2014 – 2016 **TEMPEx**. BAFU-WSL Project. *Modelling and mapping temperature extremes*: Funded budget is CHF 28'000.-. NE Zimmermann is project PI.
- 2014 – 2016 **MATES**. EU-FP7 Marie Curie Intra-European Fellowship (MC-IEF). *Understanding and predicting multispecies assemblages and interactions in space and time*. Funded budget: € 208'000.-.
- 2014 – 2016 **ECCO.DIV**. SNF Funded Research Project. *Effects of Climate and its Change on Phylogenetic, Functional and Species Diversity*. Funded budget: CHF 280'000.-, NE Zimmermann is PI.
- 2014 – 2016 **FORREGCH**. BAFU-WSL Project. *Modelling Forest Regeneration under projected climate change*: Funded budget is CHF 115'000.-. NE Zimmermann is project PI.

- 2014 – 2015 **BIO 232.** WSL Project. Updating the BIO 232 course to R and completing book chapter for Cambridge Univ. Press teaching book on “*Habitat distribution modelling in ecology*” (with Guisan & Thuiller). Funded budget is CHF 35'000.- NE Zimmermann is PI.
- 2014 – 2014 **CLIMSSENS Kt AG.** Kt. AG-WSL Project. Evaluating the climate sensitivity of the flora of the Kt. AG. Funded budget is CHF 20'000.-. NE Zimmermann is PI.
- 2013 – 2013 **LANAG Kt AG.** Kt. AG-WSL Project. Evaluating the quality and analytical (projector) power of the LANAG monitoring data to detect trends & changes in conservation status and biodiversity. CHF 50'000.-. NE Zimmermann is PI.
- 2012 – 2012 **NEOPHYTES Kt ZH.** Kt. ZH-WSL Project. Evaluating the capacity to map and detect populations of the noxious invasive weed “*Reynoutria japonica*” by use of hyperspectral remote sensing data. CHF 25'000.-. NE Zimmermann is PI.
- 2012 – 2015 **MAIOLICA II.** ETH-CCES Project. *Modelling and experiments on land-surface interactions with atmospheric chemistry and climate II.* Total budget: CHF 3.03 Mio, CCES requested part is 0.98 Mio. NE Zimmermann is leading workpackage 1 (of three) and is WSL lead scientist. WSL share is CHF 294'000.-
- 2010 – 2013 **WESTERN CONIFERS.** USDA Forest Service – Assessment of species range and demography changes under projected climate change: US\$ 90'000.-. NE Zimmermann is project Co-PI and WSL lead scientist.
- 2010 – 2012 **PORTREE.** BAFU-WSL Project. Environmental portfolio of Central European tree species. Total budget: CHF 180'000.-. NE Zimmermann is project PI and WSL lead scientist.
- 2010 – 2012 **PHYLOALP.** Mixed-funding Project. A phylogeny of plants of the European Alps. Total budget: CHF 3.0 Mio CHF. Together with UJF/CNRS Grenoble (W. Thuiller). NE Zimmermann is project PI and WSL lead scientist. Funding for WSL part so far: 350'000.- (BAFU, Kt. AG, WSL).
- 2009 – 2012 **SPEED.** SNF – Sinergia (CP). *Spatially Explicit Evolution of Diversity.* Total budget: CHF 960'000.- NE Zimmermann and PB Pearman lead workpackage three (of 3 scientific WPs). WSL share is CHF 250'000.-
- 2009 – 2012 **MOTIVE.** EU-FP7 Collaborative Project (CP). *Models for adaptive forest management.* Total budget: € 7.0 Mio. NE Zimmermann is workpackage leader (1 of 6 scientific WPs), core group member and WSL lead scientist. WSL share is € 460'000.-
- 2009 – 2011 **MANFRED.** EU-FP7 Interreg IIIb. *Management strategies to adapt Alpine Space forests to climate change risks.* Total budget: € 3.0 Mio. NE Zimmermann is workpackage leader (1 of 6 scientific WPs). WSL share is € 300'000.-, thereof ~150'000.- to NE Zimmermann for WP4.
- 2009 – 2010 **MTVEGMOD.** EU-FP7 Marie Curie Incoming International Fellowship (MC-IIF). *Advancing dynamic vegetation modeling for mountain systems vulnerable to climate and land-use change.* Total budget: € 180'000.- .
- 2008 – 2012 **HYPERSWISSNET.** SUK/ETH Project. A project to enhance research and training in hyperspectral remote sensing using the APEX sensor. Total budget: CHF 3.064 Mio. NE Zimmermann is leading modul 5 (of six) and is WSL lead scientist. WSL share is CHF 334'000.-
- 2008 – 2011 **MAIOLICA.** ETH-CCES Project. *Modelling and experiments on land-surface interactions with atmospheric chemistry and climate.* Total budget: CHF 2.08 Mio. NE Zimmermann is leading activity 2 (of three) and is WSL lead scientist. WSL share is CHF 273'000.-
- 2007 – 2011 **ECOCHANGE.** EU-FP6 Integrated Project (IP). *Challenges in assessing and forecasting biodiversity and ecosystem changes in Europe.* Total budget: € 7.0 Mio. NE Zimmermann is activity and workpackage leader and WSL lead scientist. WSL share is € 520'000.-
- 2005 – 2009 **MILLENNIUM.** EU-FP6 Integrated Project (IP). *European climate of the last Millennium.* Total budget: € 10.165 Mio. J. Esper is sub-group leader and WSL lead scientist, NE Zimmermann is workpackage leader. WSL share of NE Zimmermann is ~CHF 160'000.-
- 2004 – 2007 **INTRABIODIV.** EU-FP6 Research Project (STREP). *Tracking surrogates for intraspecific biodiversity: towards efficient selection strategies for the conservation of natural genetic resources using comparative mapping and modelling approaches.* Total budget: € 2.06 Mio. NE Zimmermann is workpackage leader (from 5 scientific WPs). WSL share is CHF 497'000.-
- 2004 – 2007 **HiVAR-TWW.** BUWAL Project (within TWW). *Using the historical range of variability of landscape elements to identify and monitor dry meadows and pastures in Switzerland – an RS and GIS-based approach.* Total budget: CHF 210'000.- NE Zimmermann is principal applicant and project leader.
- 2003 – 2007 **MfM-U/WSL.** BUWAL Project (within MfM-U). “*Monitoring flankierende Massnahmen Umwelt*”. Total budget: 2.4 Mio sFr. NE Zimmermann is project leader. The project consists of 4 workpackages, lead by C. Scheidegger, N. Kräuchi, N. Bauer, C. Steinmeier, representing 4 WSL research departments.
- 2002 – 2006 **TREELINE.** WSL/BUWAL Project (within NFI). *Scenario modeling of Alpine tree lines in Switzerland: sensitivity to climate, land use, and natural hazards.* Total budget: 200'000.- NE Zimmermann is scientific project leader.
- 2002 – 2005 **PINE.** EU FP5 Research Project (Shared Cost RTD). *Predicting Impacts in Natural Ecotones.* Total budget: € 3.306 Mio. NE Zimmermann is workpackage leader and WSL lead scientist. WSL share is CHF 412'083.-
- 2002 – 2006 **BIOME-BGC.** WSL project. *Scaling carbon fluxes from stands to landscapes – calibrating and testing BIOME-BGC along multiple environmental gradients.* Total budget is CHF 450'000.- NE Zimmermann is project leader. 2 WSL research departments are involved.

9. REVIEWING, EXPERTISES, BOARDS

Editorial Board

- *Ecography* 8/2010 – 4/2015 [JIF = 5.1; ranked 16/136 in Ecology, 3/40 in Biodiversity Conservation]
- *Global Ecology and Biogeography* 7/2011 – 4/2015 [JIF = 7.2; ranked 8/136 in Ecology, 1/45 in Geography Physical]

Reviews for National Science Foundations

- *Austria* ▪ *Belgium* ▪ *England* ▪ *Netherland* ▪ *Switzerland*

Journal Reviews

- *Ambio*
- *Arctic, Antarctic and Alpine Res.*
- *Biodiversity and Conservation*
- *Climatic Change*
- *Diversity and Distribution*
- *Ecography*
- *Ecological Applications*
- *Ecological Modelling*
- *Ecology*
- *Ecology Letters*
- *Global Change Biology*
- *Global Ecology and Biodiversity*
- *Journal of Applied Ecology*
- *Journal of Arid Environments*
- *Journal of Biogeography*
- *Journal of Vegetation Science*
- *Landscape Ecology*
- *NATURE*
- *NATURE Climate Change*
- *NATURE Communications*
- *PLoS One*
- *Remote Sensing of Environment*
- *Tree Physiology*
- *TREES – Structure and Function*

Advisory boards

- 2001: Advisory board of the Landscape Inventory Programme at WSL.
- 2012 – present: Scientific board of InfoFlora, the Swiss National Floristic Data Center.
- 2014 – present: Steering Committee member of C2SM, the ETH domain Center for Climate Systems Modelling.

Reviews for European Projects

In the last few years I am/have been reviewing FP6 & FP7 proposals. I have declined six other invitations due to scheduling conflicts.

- FP6 1st Call in *Space and Aeronautics*, Priority Theme: *GMES*, for STREPs and SSAs. 5-9. 5. 2003 in Brussels.
- FP6-2004-Infrastructures-5 Call for I3, SSA, and TA projects. 10-18.3. 2005 remote evaluation; 9-13. 5. 2005 in Brussels.
- FP7-2007-Space-1st Call for Priority Theme: *GMES*. 6.7.-20.8. 2007 remote evaluation; 10-14. 9. 2007 in Brussels.
- FP7-2012-ENV-Call for Theme 6: *Environment*. 5-20.11. 2012 remote evaluation; 26-30.11.2012 in Brussels.

Contributions to Scientific Assessment Reports

- 2012 – 2014: Contributing lead author (7. Impacts on the biodiversity of widely distributed birds and vascular plants: species richness and turnover; 8. Climate change impacts on tree species, forest properties, and ecosystem services) for the national assessment report on quantitative scenarios of climate change impacts in Switzerland (CH2014).
- 2014 – 2016: Contributing chapter author (4. Impacts of increasing drought on forest dynamics, structure, diversity, and management) for the national assessment report on the effects of drought on forests and rangelands in the United States: A comprehensive science synthesis (USDA Forest Service).
- 2015 – 2016: Chapter lead and coordinating author (2.1. Klimawandel in der Schweiz – Entwicklung walddrelevanter Klimagrößen; 3.3. Verjüngung von Buche und Fichte im Klimawandel; 3.7. Baumartenverbreitung und Standorteignung) for the national assessment report on the effects of climate change on forests (WSL and Federal Office of the Environment).
- 2015 – 2018: Coordinating chapter lead author (4. Direct and indirect drivers of change in biodiversity and nature's contributions to people) for the regional assessment report on biodiversity and ecosystem services for Europe and Central Asia of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

10. PUBLICATIONS

A. ISI Papers with Peer-review since 1999

See my publication profile: [A-4276-2008](http://www.researcherid.com/rid/A-4276-2008) (under: <http://www.researcherid.com/rid/A-4276-2008>)

In press or accepted with minor revisions

- Beck HE, Zimmermann NE, McVicar TR, Vergoplan N, Berg A & Wood EF, 2018. Present and future Köppen-Geiger climate classification maps at 1-km resolution. *Scientific Data*, in press.
- Caspersen J, Thüing E, Rigling A & Zimmermann NE, 2018. Complementarity of gymnosperms and angiosperms along an altitudinal temperature gradient. *Oikos*, in press.
- Kambach S, Lenoir J, Decocq G, Welk E, Seidler G, Dullinger S, Gégout J-C, Guisan A, Pauli H, Svenning J-C, Vittoz P, Wohlgemuth T, Zimmermann NE, Bruelheide H, 2018. Of niches and distributions: range size increases with niche breadth both globally and regionally but regional estimates poorly relate to global estimates. *Ecography*, in press.
- Saladin B, Thuiller W, Graham CH, Lavergne S, Maiorano L, Salamin N & Zimmermann NE, 2017. Environment and evolutionary history shape phylogenetic turnover in European tetrapods. *Nature Communications*, accepted with minor revisions.

2018

- Chalmandrier L, Albouy C, Descombes P, Sandel B, Faurby S, Svenning JC, Zimmermann NE & Pellissier L, 2018. Comparing spatial diversification and meta-population models in the Indo-Australian archipelago. *Royal Society Open Science* 5: 171366.
- Gallien L, Zurell D & Zimmermann NE, 2018. Frequency and intensity of facilitation reveal opposing patterns along a stress gradient. *Ecology and Evolution* 8(4): 2171-2181.
- Pellissier L, Albouy C, Bascompte J, Farwig N, Graham CH, Loreau M, Maglianesi M, Melian C, Pitteloud C, Roslin T, Rohr R, Saavedra S, Thuiller W, Woodward G, Zimmermann NE & Gravel D, 2018. Comparing species interaction networks along environmental gradients. *Biological Reviews* 93: 785-800.
- Rumpf S, Hübner K, Klöner G, Moser D, Schütz M, Wessely J, Willner W, Zimmermann NE & Dullinger S, 2018. Range dynamics of mountain plants decrease with elevation. *PNAS* 115(8): 1848-1853. [and Appendix].

- Steinbauer MJ, Grytnes JA, Jurasinski G, Kulonen A, Lenoir J, Pauli H, Rixen C, Winkler M, Bardy-Durchhalter M, Barni E, Björkman AD, Breiner FT, Burg S, Czortek P, Dawes MA, Delimat A, Dullinger S, Erschbamer B, Felde VA, Fernández-Arberas O, Fossheim KF, Gómez-García D, Georges D, Grindrud ET, Haider S, Haugum SV, Henriksen H, Herreros MJ, Jaroszewicz B, Jaroszynska F, Kanka R, Kapfer J, Klanderud K, Kühn I, Lamprecht A, Matteodo M, Morra di Cella U, Normand S, Odland A, Olsen SL, Palacio S, Pezey M, Piscová V, Sedláková B, Steinbauer K, Stöckli V, Svenning JC, Teppa G, Theurillat JP, Vittoz P, Woodin SJ, Zimmermann NE & Wipf S, 2018. Accelerated increase in plant species richness on mountain summits linked to climate warming. *NATURE* 556: 231-234.
- Xu ZW, Li MH, Zimmermann NE, Li SP, Li H, Sun H, Han XG, Jiang Y & Jiang L, 2018. Plant functional diversity modulates global environmental change effects on grassland productivity. *Journal of Ecology* 106: 1941-1951. doi: 10.1111/1365-2745.12951.
- Zhang Z, Zimmermann NE, Calle L, Hurr G, Chatterjee A & Poulter B, 2018. Enhanced response of global wetland methane emissions to recent El Niño-Southern Oscillation events. *Environmental Research Letters* 13: 074009.
- Zurell D, Gallien L, Graham CH & Zimmermann NE, 2018. Do long-distance migratory birds track their niche through seasons? *Journal of Biogeography* 45: 1459-1468. doi: 10.1111/jbi.13351.
- Zurell D, Graham CH, Gallien L, Thuiller W & Zimmermann NE, 2018. Long-distance migratory birds threatened by multiple independent risks from global change. *Nature Climate Change*. doi: 10.1038/s41558-018-0312-9.
- ## 2017
- Barros C, Guéguen M, Douzet R, Carboni M, Boulangeat I, Zimmermann NE, Münckmüller T & Thuiller W, 2017. Extreme climate events counteract the effects of climate and land-use changes in Alpine tree lines. *Journal of Applied Ecology* 54: 39-50.
- Chala D, Zimmermann NE, Brochmann C & Bakkestuen V, 2017. Migration corridors for alpine plants among the 'sky islands' of eastern Africa: do they, or did they exist? *Alpine Botany* 127:133-144.
- D'Amen M, Rahbek C, Zimmermann NE & Guisan A, 2017. Spatial predictions at the community level: from current approaches to future frameworks. *Biological Reviews* 92: 169-187.
- Gallien L, Altermatt F, Wiemers M, Schweiger O & Zimmermann NE, 2017. Invasive plants threaten the least mobile butterflies in Switzerland. *Diversity and Distribution* 23: 185-195.
- Gallien L, Zimmermann NE, Levine JM & Adler PB, 2017. The effects of intransitive competition on coexistence. *Ecology Letters* 20: 791-800.
- Jucker T, Caspersen J, Chave J, Antin C, Barbier N, Bongers F, Dalponte M, van Ewijk KY, Forrester DI, Haeri M, Higgins SI, Holdaway RJ, Iida Y, Lorimer C, Marshall PL, Momo S, Moncrieff GR, Ploton P, Poorter L, Abd Rahman K, Schlund M, Sonké B, Sterck FJ, Trugman AT, Usoltsev VA, Vanderwel MC, Waldner P, Wedeux BMM, Wirth C, Wöll H, Woods M, Xiang WH, Zimmermann NE & Coomes DA, 2017. Allometric equations for integrating remote sensing imagery into forest monitoring programmes. *Global Change Biology* 23: 177-190.
- Karger DN, Conrad O, Böhner J, Kawohl T, Kreft H, Soria-Azuza RW, Zimmermann NE, Linder HP & Kessler M, 2017. Climatologies at high resolution for the earth's land surface areas. *Scientific Data* 4: 170122.
- Loran C, Munteanu C, Verburg PH, Schmatz DR, Bürgi M & Zimmermann NE, 2017. Long-term change in drivers of forest cover expansion: an analysis for Switzerland (1850-2000). *Regional Environmental Change* 17: 2223-2235.
- Rubio-Salcedo M, Psomas A, Prieto M, Zimmermann NE & Martínez I, 2017. Case study of the implications of climate change for lichen diversity and distributions. *Biodiversity and Conservation* 26(5): 1121-1141.
- Reyer CPO, Bathgate S, Blennow K, Borges JG, Bugmann H, Delzon S, Faiss SP, Garcia-Gonzalo J, Gardiner B, Gonzalez-Olabarria JR, Gracia C, Guerra J, Kellomäki S, Kramer K, Lexer MJ, Lindner M, van der Maaten E, Maroschek M, Muys B, Nicoll B, Palahi M, Palma JHN, Paulo JA, Peltola H, Pukkala T, Rammer W, Ray D, Sabaté S, Schelhaas MJ, Seidl R, Temperli C, Tomé M, Yousefpoor R, Zimmermann NE & Hanewinkel M, 2017. Are forest disturbances amplifying or canceling out climate change-induced productivity changes in European forests? *Environmental Research Letters* 12: 034027.
- Sáenz-Romero C, Lamy JB, Ducousso A, Musch B, Ehermann F, Delzon S, Cavers S, Chalupka W, Dağdaş S, Hansen JK, Lee SJ, Liesebach M, Rau HM, Psomas A, Schneck V, Steiner W, Zimmermann NE & Kremer A, 2017. Adaptive and plastic population response of *Quercus petraea* to climate across Europe. *Global Change Biology* 23: 2831-2847. doi: 10.1111/gcb.13576
- Saladin B, Leslie AB, Wüest RO, Litsios G, Conti E, Salamin N & Zimmermann NE, 2017. Fossils matter: improved estimates of divergence times in *Pinus* reveal older diversification. *BMC Evolutionary Biology* 17:95. doi: 10.1186/s12862-017-0941-z.
- Serra-Varela MJ, Alía R, Ruiz Daniels R, Zimmermann NE, Gonzalo-Jiménez J & Grivet D, 2017. Assessing vulnerability of two Mediterranean conifers to support genetic conservation management in the face of climate change. *Diversity and Distribution* 23: 507-516.
- Smyčka J, Renaud J, Thuiller W, Zimmermann NE, Lavergne S & Roquet C, 2017. Disentangling drivers of plant endemism and diversification in the European Alps - a phylogenetic and spatially explicit approach. *Perspectives in Plant Ecology, Evolution and Systematics* 28: 19-27.
- Somodi I, Molnár Z, Bálint C, Bede-Fazekas Á, Bölöni J, Pámsztor L, Laborczai A & Zimmermann NE, 2017. Implementation and application of Multiple Potential Natural Vegetation models – a case study of Hungary. *Journal of Vegetation Science* 28: 1260-1269.
- Wang SY, Xu XT, Shrestha N, Zimmermann NE, Tang ZY & Wang ZH Response of spatial vegetation distribution in China to climate changes since the Last Glacial Maximum (LGM). *PLoS ONE* 12(4): e0175742.
- Yousefpoor R, Temperli C, Jacobsen JB, Thorsen BJ, Meilby H, Lexer MJ, Lindner M, Bugmann H, Borges JG, Palma JHN, Blennow K, Ray D, Zimmermann NE, Delzon S, Kremer A, Kramer K, Reyer C, Lasch P, Garcia-Gonzalo J & Hanewinkel M, 2017. A framework for modelling adaptive forest management and decision-making under climate change. *Ecology and Society* 22(4): 40.
- Zhang Z, Zimmermann NE, Sterke A, Li X, Hodson H, Zhu GF, Huang CL & Poulter B, 2017. Emerging role of wetland methane emissions in driving 21st century climate change. *PNAS* 114(36): 9647-9652.
- ## 2016
- Boucher FC, Zimmermann NE & Conti E, 2015. Allopatric speciation with little niche divergence is common in alpine Primulaceae. *Journal of Biogeography* 43: 591-602.
- Chala D, Brochmann C, Psomas A, Ehrich D, Gizaw A, Masao CA, Bakkestuen V & Zimmermann NE, 2016. Good-bye to tropical alpine plant giants under warmer climates? Loss of range and genetic diversity in *Lobelia rhynchopetalum*. *Ecology & Evolution* 6: 8931-8941.
- Clark JS, Iverson L, Woodall CW, Allen CD, Bell DM, Bragg D, D'Amato AW, Davis FW, Hersh M, Ibanez I, Jackson ST, Matthews S, Pederson N, Peters M, Schwartz M, Waring K & Zimmermann NE, 2016. The impacts of increasing drought on forest dynamics, structure, and biodiversity. *Global Change Biology* 22: 2329-2352.
- Douda J, Boublik K, Slezák M, Biurn I, Nociar J, Havrdová A, Doudová J, Acic S, Brisse H, Brunet J, Chytrý M, Claessens H, Csiky J, Didukh Y, Dullinger S, Fitzpatrick U, Guisan A, Horchler PJ, Hrivnák R, Jandt U, Kački Z, Kevey B, Landucci F, Lecomte H, Lenoir J, Paal J, Patemoster D, Pauli H, Pielech R, Rodwell JS, Roelandt B, Svenning JC, Šibík J, Šic U, Tzonev RT, Wohlgenuth T & Zimmermann NE, 2015. Vegetation classification of European floodplain forests and alder carrs. *Applied Vegetation Science* 19: 147-163.
- Gallien L, Saladin B, Boucher FC, Richardson DM & Zimmermann NE, 2015. Can the legacy of historical biogeography shape current invasiveness in pines? *New Phytologist* 209: 1096-1105.
- Girardin MP, Bouriaud O, Hogg EH, Kurz WA, Zimmermann NE, Metsaranta J, de Jong R, Frank DC, Esper J, Büntgen U, Guo XJ, Bhatti J, 2016. No growth stimulation of Canada's boreal forest under half-century of combined warming and CO2 fertilization. *PNAS* 113(52): E8406-E8414.
- Huelber K, Wessely J, Gattlinger A, Moser D, Kuttner M, Essl F, Leitner M, Winkler M, Ertl S, Willner W, Kleinbauer I, Sauberer N, Mang T, Zimmermann NE & Dullinger S 2016. Uncertainty in predicting range dynamics of endemic alpine plants under climate warming. *Global Change Biology* 22: 2608-2619.
- Hurdu B-I, Escalante T, Puşcaş M, Novikoff A, Bartha L & Zimmermann NE, 2016. Exploring the different facets of plant endemism in the South-Eastern Carpathians: a manifold approach for the determination of biotic elements, centres and areas of endemism. *Biological Journal of the Linnean Society* 119: 649-672.
- Kirchheimer B, Schinkel CCF, Dellinger AS, Klatt S, Moser D, Winkler M, Lenoir J, Caccianiga M, Guisan A, Nieto-Lugilde D, Svenning J-C, Thuiller W, Vittoz P, Willner W, Zimmermann NE, Hörandl E & Dullinger S, 2015. A matter of scale: Apparent niche differentiation of diploid and tetraploid plants may depend on extent and grain of analysis. *Journal of Biogeography*, 43: 716-726.
- Körner C, Basler D, Hoch G, Kollas C, Lenz A, Randin C, Vítasse Y & Zimmermann NE, 2016. Where, why and how? Explaining the low temperature range limits of temperate tree species. *Journal of Ecology* 104: 1076-1088.
- Kunstler G, Falster D, Coomes DA, Hui F, Kooyman RM, Laughlin DC, Poorter L, Vanderwel M, Vieilledent G, Wright SJ, Aiba M, Baraloto C, Caspersen J, Cornelissen JHC, Goulet-Fleury S, Hanewinkel M, Herault B, Kattge J, Kurokawa H, Onoda Y, Peñuelas J, Poorter H, Uriarte M, Richardson S, Ruiz-Benito P, Sun I-F, Ståhl G, Swenson NG, Thompson J, Westerlund B, Wirth C, Zavala MA, Zeng HC, Zimmermann JK, Zimmermann NE & Westoby M, 2016. Plant functional traits have globally consistent effects on competition. *NATURE* 529: 204-207.
- Pellissier L, Eidesen PB, Ehrich D, Descombes P, Schönswetter P, Tribsch A, Westergaard KB, Alvarez N, Guisan A, Zimmermann NE, Normand S, Vittoz P, Luoto M, Damgaard C, Brochmann C, Wisz MS & Alsos IG, 2015. Past climate-driven range shifts and population genetic diversity in Arctic plants. *Journal of Biogeography* 43: 461-470.
- Wüest RO, Litsios G, Forest F, Lexer C, Linder HP, Salamin N, Zimmermann NE & Pearman PB, 2016. Resprouter fraction in Cape Restionaceae assemblages varies with climate and soil type. *Functional Ecology* 30: 1583-1592.

- Zhang Z, Zimmermann NE, Kaplan JO & Poulter B, 2016. Modeling spatio-temporal dynamics of global wetlands: comprehensive evaluation of a new sub-grid TOPMODEL parameterization and uncertainties. *Biogeosciences* 13: 1387-1408.
- Zurell D, Thuiller W, Pagel J, Samento Cabral J, Muenkenmueller T, Gravel D, Dullinger S, Normand S, Schiffers K, Moore KA & Zimmermann NE. Benchmarking novel approaches for modelling species range dynamics. *Global Change Biology* 22: 2651-2664.
- Zurell D, Zimmermann NE, Sattler T, Nobis MP & Schröder B, 2016. Effects of functional traits on the prediction accuracy of species richness models. *Diversity and Distribution* 22: 905-917.
- ## 2015
- Bouriaud L, Bouriaud O, Elkin C, Tempert C, Reyser C, Duduman G, Bamoaiea I, Nichiforel L, Zimmermann NE & Bugmann H, 2014. Age-class disequilibrium as an opportunity for adaptive forest management in the Carpathian Mountains, Romania. *Regional Environmental Change* 15: 1557-1568.
- Dullinger S, Dendoncker N, Gattringer A, Leitner M, Mang T, Moser T, Múcher CA, Plutzer C, Rounsevell M, Willner W, Zimmermann NE & Hülber K, 2015. Modelling the effect of habitat fragmentation on climate driven migration of European forest understorey plants. *Diversity and Distribution* 21: 1375-1387.
- Frank DC, Poulter B, Saurer M, Esper J, Huntigford C, Helle G, Treydte KS, Zimmermann NE, Schleser GH, Ahlström A, Ciais P, Friedlingstein P, Levis S, Lomas M, Sitch S, Viovy N, Andreu-Hayles L, Bednarz Z, Berninger F, Boettger T, D'Alessandro CM, Daux V, Filot M, Grabner M, Gutierrez E, Haupt M, Hilasvuori E, Jungner H, Kalela-Brundin M, Krapiec M, Leuenberger M, Loader NJ, Marah H, Masson-Delmotte V, Pazdur A, Pawelczyk S, Pierre M, Planells O, Pukiene R, Reynolds-Henne CE, Rinne KT, Saracino A, Sonninen E, Stievenard M, Switsur VR, Szczepanek M, Szychowska-Krapiec E, Todaro L, Waterhouse JS & Weigl M 2015. Water use efficiency and transpiration across European forests during the Anthropocene. *NATURE Climate Change* 5: 579-583.
- Luo WT, Elser JJ, Lue XT, Wang ZW, Bai E, Yan CF, Wang C, Li MH, Zimmermann NE, Han XG, Jiang Y, 2015. Plant nutrients do not covary with soil nutrients under changing climatic conditions. *Global Biogeochemical Cycles* 29: 1298-1308.
- Nieto-Lugilde D, Lenoir J, Abdulhak S, Aeschmann D, Dullinger S, Gégout J-C, Guisan A, Pauli H, Renaud J, Theurillat J-P, Thuiller W, Van Es J, Vittoz P, Willner W, Wohlgemuth T, Zimmermann NE & Svenning J-C. 2014. Tree cover interacts with shade tolerance to shape plant species distributions across the Alps at both fine and coarse spatial grains *Ecography* 38: 578-589.
- Poulter B, Cadule P, Cheiney A, Ciais P, Hodson E, Peylin P, Plummer S, Spessa A, Saatchi S, Yue C & Zimmermann NE, 2015. Sensitivity of global terrestrial carbon cycle dynamics to variability in satellite-observed burned area. *Global Biogeochemical Cycles* 29: 207–222, doi: 10.1002/2013GB004655.
- Schelhaas MJ, Nabuurs GJ, Hengeveld G, Reyser C, Hanewinkel M, Zimmermann NE & Cullmann D. 2014. Adaptive forest management to account for climate change-induced productivity and species suitability changes in Europe. *Regional Environmental Change* 15: 1581-1594.
- Serra-Varela MJ, Grivet D, Vincenot L, Broennimann O, Gonzalo-Jiménez J & Zimmermann NE, 2015. Does phylogeographic structure relate to climatic niche divergence? A test using maritime pine (*Pinus pinaster* Ait.). *Global Ecology and Biogeography* 24: 1302-1313.
- Wasof S, Lenoir J, Aarrestad PA, Alsos IG, Ambruster WS, Austreim G, Bakkestuen V, Birks HJB, Bräthen KA, Broennimann O, Brunet J, Bruun HH, Dahlberg CJ, Dieckmann M, Dullinger S, Dynesius M, Ejnæs R, Gégout JC, Graae BJ, Grytnes JA, Guisan A, Hylander K, Jónsdóttir IS, Kapfer J, Klanderud K, Luoto M, Milbau A, Moora M, Nygaard B, Odland A, Pauli H, Ravolainen V, Reinhardt S, Sandvik SM, Schei FH, Speed J, Svenning JC, Thuiller W, Tveraaab LU, Vandvik V, Velle LG, Virtanen R, Vittoz P, Willner W, Wohlgemuth T, Zimmermann NE, Zobel M, Decocq G, 2015. Disjunct populations of European vascular plant species keep the same climatic niches *Global Ecology and Biogeography* 24: 1401-1412.
- Wüest RO, Antonelli A, Zimmermann NE & Linder HP, 2015. Available climate regimes drive niche diversification during range expansion. *American Naturalist* 185(5): 640-652.
- ## 2014
- Boulangeat I, Georges D, Dentant C, Bonet R, Van Es J, Abdulhak S, Zimmermann NE & Thuiller W, 2014. Anticipating the spatio-temporal response of plant diversity and vegetation structure to climate and land use change in a protected area. *Ecography* 37: 1230-1239.
- Carlson BZ, Choler P, Delastrade A, Georges D, Rabate A, Randin CF, Renaud J, Zimmermann NE & Thuiller W, 2014. Accounting for tree line shift, glacier retreat and primary succession in mountain plant distribution models *Diversity and Distribution* 20: 1379-1391.
- Duputié A, Zimmermann NE & Chuine I, 2014. Where are the wild things? Why we need better data on species distribution. *Global Ecology and Biogeography* 23: 457–467.
- Hanspach J, Schweiger O, Kühn I, Plattner M, Pearman PB, Zimmermann NE & Settle J, 2014. Extending the stress gradient hypotheses: host plant availability limits butterfly distribution under harsh environmental conditions. *Ecography* 37: 301–308.
- Lexer C, Wüest RO, Mangili S, Heuertz M, Stolting K, Pearman PB, Forest F, Salamin N, Zimmermann NE & Bossolini E, 2014. Genomics of the divergence continuum in an African plant biodiversity hotspot. I: Drivers of population divergence in *Restio capensis* (Restionaceae) *Molecular Ecology* 23: 4373-4386.
- Lindner M, Fitzgerald JB, Zimmermann NE, Reyser C, Delzon S, van der Maaten E, Schelhaas MJ, Lasch P, Eggers J, van der Maaten-Theunissen M, Suckow F, Psomas A, Poulter B & Hanewinkel M, 2014. Climate Change and European Forests: What do we know, what are the uncertainties, and what are the implications for forest management? *Journal of Environmental Management* 146: 69-83.
- Litsios G, Wüest RO, Kostikova A, Forest F, Lexer C, Linder HP, Pearman PB, Zimmermann NE & Salamin N, 2014. Effects of a fire response trait on diversification in replicated radiations. *Evolution* 68(2): 453–465.
- Maggini R, Lehmann A, Zbinden N, Zimmermann NE, Bolliger J, Schröder B, Foppen R, Schmid H, Beniston M & Jenni L, 2014. Assessing the vulnerability of Swiss breeding birds to climate and land-use change. *Diversity and Distribution* 20, 708-719.
- Meier ES, Dullinger S, Zimmermann NE, Baumgartner D, Gattringer A & Hülber K, 2014. Space matters when defining effective management for invasive plants. *Diversity and Distribution* 20: 1029-1043.
- Merow C, Smith MJ, Edwards TC, Jr, Guisan A, McMahon SM, Normand S, Thuiller W, Wüest RO, Zimmermann NE & Elith J, 2014. Back to the basics of species distribution modeling: what do we gain from complex versus simple models? *Ecography* 37: 1267-1281.
- Münkemüller T, Gallien L, Lavergne S, Renaud J, Roquet C, Abdulhak S, Dullinger S, Garraud L, Guisan A, Lenoir J, Svenning, JC, Van Es J, Vittoz P, Willner W, Wohlgemuth T, Zimmermann NE & Thuiller W, 2014. Scale decisions can reverse conclusions on community assembly processes. *Global Ecology and Biogeography* 23(6): 620–632.
- Normand S, Zimmermann NE, Schurr FM & Lischke H, 2014. Demography as the basis for understanding and predicting range dynamics. *Ecography* 37: 1149-1154.
- Patsiou TS, Conti E, Zimmermann NE, Theodoridis S & Randin CF, 2014. Topo-climatic microrefugia explain the persistence of a rare endemic plant in the Alps during the last 21 millennia. *Global Change Biology* 20: 2286-2290.
- Pearman PB, Lavergne S, Roquet C, Wüest RO, Zimmermann NE & Thuiller W, 2014. Phylogenetic patterns of climatic, habitat and trophic niches in a European avian assemblage. *Global Ecology and Biogeography* 23: 414-424.
- Pottier J, Malenovsky Z, Psomas A, Homolova L, Schaeppman M, Choler P, Thuiller W, Guisan A & Zimmermann NE, 2014. Modelling plant species distribution and diversity in alpine grasslands using airborne imaging spectroscopy. *Biology Letters* 10(7): 20140347.
- Thuiller W, Guéguen M, Georges D, Bonet R, Chalmardier L, Garraud L, Renaud J, Roquet C, Van Es J, Zimmermann NE & Lavergne S, 2014. Are different facets of plant diversity well protected against climate and land cover changes? A test study in the French Alps. *Ecography* 37: 1254-1266.
- Thuiller W, Münkemüller T, Schiffers KH, Georges D, Dullinger S, Eckhart VM, Edwards TC, Jr, Gravel D, Kunstler G, Merow C, Moore K, Piedallu C, Vissault S, Zimmermann NE Zurell D, & Schurr FM, 2014. Does probability of occurrence relate to population dynamics? *Ecography* 37: 1155-1166.
- Thuiller W, Pironon S, Psomas A, Barbet-Massin M, Jiguet F, Lavergne S, Pearman PB, Renaud J, Zupan L & Zimmermann NE, 2014. The functional tree of life of European avifauna in face of global change. *NATURE Communications* 5: 3118.
- ## 2013
- Alberto FJ, Derory J, Bouy C, Frigerio J-M, Zimmermann NE & Kremer A, 2013. Imprints of natural selection along environmental gradients in phenology-related genes of *Quercus petraea*. *Genetics* 195: 495–512.
- Coops NC, Morsdorf F, Schaeppman ME & Zimmermann NE, 2013. Characterization of an Alpine Treeline using Airborne LiDAR Data and Physiological Modeling. *Global Change Biology* 19: 3808–3821.
- D'Amen M, Zimmermann NE & Pearman PB, 2013. Conservation of phylogeographic lineages under climate change. *Global Ecology and Biogeography* 22: 93-104.
- Dawson MN, Algar AC, Antonelli A, Dávalos LM, Davis E, Early R, Guisan A, Jansson R, Lessard J-P, Marske KA, McGuire J, Stigall AL, Swenson NG, Zimmermann NE & Gavin DG, 2013. An horizon scan of biogeography. *Frontiers of Biogeography* 5(2): 130-157.
- Delzon S, Uri M, Samalens J-C, Lamy J-B, Lischke H, Sin F, Zimmermann NE & Porté A 2013. Field evidence of colonisation by Holm oak, at the northern margin of its distribution range, during the Anthropocene period. *PLoS ONE* 8(11): e80443.
- Engler R, Waser L, Zimmermann NE, Schaub M, Berdos S, Ginzler C & Psomas A, 2013. Combining ensemble modeling and remote sensing for mapping individual tree species at high spatial resolution. *Forest Ecology and Management* 310: 64-73.
- Hanewinkel M, Cullmann DA, Schelhaas M-J, Nabuurs G-J & Zimmermann NE, 2013. Climate change may cause severe losses in economic value of European forestland. *NATURE Climate Change* 3: 203–207.

- Lexer C, Stölting KN, Mangili S, Forest F, Bossolini E, Pearman PB, Zimmermann NE & Salamin N, 2013. 'Next generation' biogeography: towards understanding the drivers of species diversification and persistence. *Journal of Biogeography* 40: 1013–1022.
- Maiorano L, Amori G, Capula M, Faluccci A, Masi M, Montemaggiore A, Pottier J, Psomas A, Rondinini C, Russo D, Zimmermann NE, Boitani L & Guisan A, 2013. Threats from climate change to terrestrial vertebrate hotspots in Europe. *PLoS ONE* 8(9): e74989.
- Maiorano L, Cheddadi R, Zimmermann NE, Pellissier L, Petitpierre B, Pottier J, Laborde H, Hurdu BI, Pearman PB, Psomas A, Singarayer JS, Broennimann O, Vittoz P, Dubuis A, Edwards ME, Binney HA & Guisan A, 2013. Building the niche through time: using 13,000 years of data to predict the effects of climate change on three tree species in Europe. *Global Ecology and Biogeography* 22: 302–317.
- Normand S, Randin C, Ohlemüller R, Bay C, Høye T, Kjør ED, Körner, Lischke G, Maiorano L, Paulsen J, Pearman PB, Psomas AP, Treier UA, Zimmermann NE & Svenning JC, 2013. A greener Greenland? Climatic potential and long-term constraints on the future expansion of trees and shrubs across a large Arctic region. *Philosophical Transactions of the Royal Society B* 368: 20120479.
- Parviainen M, Zimmermann NE, Heikkinen RK & Luoto M, 2013. Using unclassified continuous remote sensing data to improve distribution models of red-listed plant species. *Biodiversity and Conservation*. 22: 1731-1754.
- Pellissier L, Bräthen KA, Vittoz P, Yoccoz NG, Dubuis A, Meier ES, Zimmermann NE, Randin C, Thuiller W, Garraud L, Van Es J & Guisan A, 2013. Conservatism of cold thermal limits in arctic-alpine plants. *Global Ecology and Biogeography* 22: 933-941.
- Randin CF, Paulsen J, Vitasse Y, Kollas C, Wohlgemuth T, Zimmermann NE & Körner C, 2013. Do altitudinal limits of deciduous tree species match with their thermal latitudinal limits? *Global Ecology and Biogeography* 22: 913-923.
- Zimmermann NE, Normand S & Psomas A, 2013. Climate change and range shifts in mountain plants of the European Alps and Carpathians. *Acta Biologica Cracoviensia Series B* 55 (Suppl. 1): 18-18.
- 2012**
- Alvarez N, Manel S, Schmitt T & INTRABIODIV consortium (incl. NE Zimmermann), 2011. Contrasting diffusion of Quaternary gene pools across Europe: The case of the arctic-alpine *Gentiana nivalis* L. (Gentianaceae). *Molecular Ecology* 207: 408-413.
- Broennimann O, Fitzpatrick M, Pearman PB, Petit-Pierre B, Pellissier L, Yoccoz NG, Thuiller W, Fortin M-J, Randin C, Zimmermann NE, Graham CH & Guisan A, 2012. Measuring ecological niche overlap from occurrence and spatial environmental data. *Global Ecology and Biogeography* 21(4): 481-497.
- Dullinger S, Gattlinger A, Thuiller W, Moser D, Zimmermann NE, Guisan A, Willner W, Plutzer C, Leitner M, Mang T, Caccianiga M, Dimböck T, Ertl S, Fischer A, Lenoir J, Svenning J-C, Psomas P, Schmatz DR, Silc U, Vittoz P & Hülber K, 2012. Extinction debt of high-mountain plants under twenty-first-century climate change. *NATURE Climate Change* 2(8): 619-622.
- Gallien L, Douzet R, Pratte S, Zimmermann NE & Thuiller W, 2012. Invasive species distribution models - how violating the equilibrium assumption can create new insights. *Global Ecology and Biogeography* 21(11): 1126–1136.
- Kaplan JO, Krumhardt KM & Zimmermann NE, 2012. The effects of human land use and climate change over the past 500 years on the carbon cycle of Europe. *Global Change Biology*, 18(3): 902-914.
- Kissling WD, Dormann CF, Groeneveld J, Hickler T, Kühn I, McInerney G, Montoya JM, Römermann C, Schifffers K, Schurr FM, Singer A, Svenning J-C, Zimmermann NE & O'Hara RB, 2012. Novel approaches to modelling biotic interactions in multispecies assemblages at broad spatial scales. *Journal of Biogeography*: 39: 2163–2178.
- Kunstler G, Lavergne S, Courbaud B, Thuiller W, Vieilledent G, Zimmermann NE, Kattge J & Coomes DA, 2012. Competitive interactions between forest trees are driven by species' trait hierarchy, not phylogenetic or functional similarity: implications for forest community assembly. *Ecology Letters* 15: 831–840.
- Litsios G, Pellissier L, Forest F, Lexer C, Pearman PB, Zimmermann NE & Salamin N, 2012. Trophic level influences the rate of environmental niche evolution in damselfish. *Proc. R. Soc. B* 279: 3662–3669.
- Litsios G, Sims CA, Wueest RO, Pearman PB, Zimmermann NE & Salamin N, 2012. Mutualism with sea anemones triggered the adaptive radiation of clownfishes. *BMC Evolutionary Biology* 12:212.
- Manel S, Gugerli F, Thuiller W, Alvarez N, Legendre O, Holderegger R, Gielly L, Taberlet P & INTRABIODIV consortium (incl. NE Zimmermann), 2011. Broad-scale adaptive genetic variation in alpine plants is driven by temperature and precipitation. *Molecular Ecology* 21: 3729–3738.
- Meier ES, Lischke H, Schmatz DR & Zimmermann NE, 2012. Climate, competition and connectivity affect future migration and ranges of European trees. *Global Ecology and Biogeography* 21: 164-178.
- Schurr FM, Pagel J, Cabral JS, Groeneveld J, Bykova O, O'Hara RB, Kissling WD, Linder HP, Midgley GF, Schröder B, Singer A & Zimmermann NE, 2012. How to understand species niches and range dynamics: a demographic research agenda for biogeography. *Journal of Biogeography* 39: 2146–2162.
- Taberlet P, Zimmermann NE, Englisch T, Tribsch A, Holderegger R, Alvarez N, Nikfeld H, Coldea G, Mirek Z, Molanen A, Ahlmer W, Ajmone Marsan P, Bona E, Bovio M, Choler P, Cieślak E, Colli L, Cristea V, Dalmas J-P, Frajman B, Garraud L, Gaudeul M, Gielly L, Gutermann W, Jogan N, Kagalo AA, Korbecka G, Kűpfer P, Lequette B, Letz DR, Manel S, Mansion G, Marhold K, Martini F, Negrini R, Niño F, Pauton O, Pellecchia M, Perico G, Piękoś-Mirkowa H, Prosser F, Puşcaş M, Ronikier M, Scheuerer M, Schneeweiss GM, Schönswetter P, Schratl-Ehrendorfer L, Schűpfer F, Selvaggi A, Steinmann K, Thiel-Egenter C, van Loo M, Winkler M, Wohlgemuth T, Wraber T, Ț, Gugerli F & *IntraBioDiv Consortium*, 2012. Genetic diversity in widespread species is not congruent with species richness in alpine plant communities. *Ecology Letters* 15(12): 1439–1448.
- Zurell D, Grimm V, Rossmann E, Zbinden N, Zimmermann NE & Schröder B, 2012. Uncertainty in predictions of range dynamics: Black grouse climbing the Swiss Alps. *Ecography* 35: 590-603.
- 2011**
- D'Amen M, Bombi P, Pearman PB, Schmatz DR, Zimmermann NE & Bologna MA, 2011. Will climate change reduce the efficacy of protected areas for amphibian conservation in Italy? *Biological Conservation* 144: 989–997.
- Beaumont LJ, Pitman A, Perkins S, Zimmermann NE, Yoccoz NG & Thuiller W, 2011. Impacts of climate change on the world's most exceptional ecoregions. *Proc. Nat. Acad. Sci. USA* 108(6): 2306-2311.
- Engler R, Randin C, Thuiller W, Dullinger S, Zimmermann NE, Araújo MB, Pearman PB, Albert CH, Choler P, de Lamo X, Dimböck T, Gómez-García D, Grytnes J-A, Heegard E, Høistad F, Le Lay G, Nogués-Bravo D, Normand S, Piédalu C, Puscas M, Sebastià M-T, Stanisci A, Theunillat J-P, Trivedi M, Vittoz P & Guisan A, 2011. Climate change impacts on European mountain plant diversity. *Global Change Biology* 17: 2330–2341.
- Hodson EL, Poulter B, Zimmermann NE, Prigent C & Kaplan JO, 2011. The El Niño–Southern Oscillation and wetland methane interannual variability. *Geophysical Research Letters* 38: L08810, doi:10.1029/2011GL046861.
- Kunstler G, Albert CH, Courbaud B, Lavergne S, Thuiller W, Vieilledent G, Zimmermann NE & Coomes DA, 2011. Effects of competition on tree radial-growth vary in importance but not in intensity along climatic gradients in the French Alps. *Journal of Ecology* 99: 300-312.
- Maiorano L, Faluccci A, Guisan A, Zimmermann NE, Psomas A, Pottier J, Baisero D, Rondinini C & Boitani L, 2011. The future of terrestrial mammals in the Mediterranean basin under climate change. *Phil. Trans R. Soc. B* 366: 2681–2692.
- Meier ES, Edwards TC, jr., Kienast F, Dobbertin M & Zimmermann NE, 2011. Co-occurrence patterns of trees along macro-climatic gradients and their potential influence on the present and future distribution of *Fagus sylvatica* L. *Journal of Biogeography* 38: 371–382.
- Meirmans PG, Goudet J, INTRABIODIV consortium (incl. NE Zimmermann) & Gaggiotti OE, 2011. Ecology and life history affect different aspects of the population structure of 27 high-alpine plants. *Molecular Ecology* 20: 3144–3155.
- Pearman PB, Guisan A & Zimmermann NE, 2011. Impacts of climate change on Swiss biodiversity: An indicator taxa approach. *Biological Conservation* 144: 866-875.
- Poulter B, Ciais P, Hodson EL, Lischke H, Maignan F, Plummer S & Zimmermann NE, 2011. Plant functional types mapping for earth system models. *Geosciences Model Development* 4: 993-1010.
- Poulter B, Frank DC, Hodson EL & Zimmermann NE, 2011. Impacts of land cover and climate data selection on understanding terrestrial carbon dynamics and the CO2 airborne fraction. *Biogeosciences* 8: 1617-1642.
- Psomas A, Kneubühler M, Itten K & Zimmermann NE, 2011. Hyperspectral remote sensing for estimating aboveground biomass and for exploring species richness patterns of grassland habitats. *International Journal of Remote Sensing* 32(24): 9007-9031.
- Steinmann K, Eggenberg S, Wohlgemuth T, Linder HP & Zimmermann NE, 2011. Niches and Noise - Disentangling habitat diversity and area effect on species diversity. *Ecological Complexity* 8: 313-319.
- Thiel-Egenter C, Alvarez N, Holderegger R, et al. & INTRABIODIV consortium (incl. NE Zimmermann) 2011. Break zones in the distributions of alleles and species in alpine plants. *Journal of Biogeography* 38(4): 772-782.
- Wellstein C, Schröder B, Reineking B & Zimmermann NE, 2011. Understanding species and community response to environmental change - a functional trait perspective. *Agriculture, Ecosystems and Environment* 145: 1-4.
- 2010**
- Albert C, Yoccoz NG, Edwards T Jr., Graham GH, Zimmermann NE & Thuiller W, 2010. Sampling in ecology and evolution – bridging the gap between theory and practice. *Ecography* 33: 1028-1037.
- Huber S, Koetz B, Psomas A, Kneubühler M, Schopfer JT, Itten KI & Zimmermann NE, 2010. Impact of multiangular information on empirical models to estimate canopy nitrogen concentration in mixed forest. *Journal of Applied Remote Sensing* 4; article 043530.

- Lenoir J, Gégout J-C, Guisan A, Vittoz P, Wohlgemuth T, Zimmermann NE, Dullinger S, Pauli H, Willner W, Grytnes J-A, Virtanen R & Svenning J-C, 2010. Cross-scale analysis of the region effect on vascular plant species diversity in Southern and Northern European mountain ranges. *PLoS ONE* 5(12): e15734.
- Lenoir J, Gégout J-C, Guisan A, Vittoz P, Wohlgemuth T, Zimmermann NE, Dullinger S, Pauli H, Willner W & Svenning J-C, 2010. Going against the flow: potential mechanisms for unexpected downslope range shifts in a warming climate. *Ecography* 33: 295–303.
- McVicar TR, Van Niel TG, Roderick ML, Li LT, Mo XG, Schmatz D & Zimmermann NE, 2010. Observational evidence from two mountainous regions that near-surface wind speeds are declining more rapidly at higher elevations than lower elevations: 1960–2006. *Geophysical Research Letters*, 37: L06402, doi:10.1029/2009GL042255.
- Meier ES, Kienast F, Pearman PB, Svenning J-C, Thuiller W, Araujo MB, Guisan A & Zimmermann NE, 2010. Biotic and abiotic variables show little redundancy in explaining tree species distributions. *Ecography* 33: 1038–1048.
- Pearman PB, D'Amen M, Graham CH, Thuiller W, & Zimmermann NE, 2010. Within taxon niche structure: Niche conservatism, divergence and predicted effects of climate change. *Ecography* 33: 990–1003.
- Pellissier L, Brathen KA, Pottier J, Randin C, Vittoz P, Dubuis A, Yoccoz NG, Alm T, Zimmermann NE & Guisan A, 2010. Species distribution models reveal apparent competitive and facilitative effects of a dominant species on the distribution of tundra plants. *Ecography* 33: 1004–1014.
- Rammig A, Jonas T, Zimmermann NE & Rixen C, 2010. Changes in alpine plant growth under future climate conditions. *Biogeosciences* 7: 2013–2024.
- Somodi I, Virágh K, Székely B & Zimmermann NE, 2010. Changes in predictor influence with time and with vegetation type identity in a post-abandonment situation. *Basic and Applied Ecology* 11: 225–233.
- Winkler M, Tribsch A, Paun O, Englisch T, Schönswetter P & INTRABIODIV consortium (incl. NE Zimmermann) 2010. Pleistocene distribution range shifts were accompanied by breeding system divergence within *Homungia alpina* (Brassicaceae) in the Alps. *Molecular Phylogenetics and Evolution* 54: 571–582.
- Zimmermann NE, Edwards TC, Graham CG, Pearman PB & Svenning J-C, 2010. New trends in species distribution modelling. *Ecography* 33: 985–989.
- 2009**
- Alvarez N, Thiel-Egenter C, Tribsch A, Holderegger R, Manel S, Schönswetter P, Taberlet P, Brodbeck S, Gaudeul M, Gielly L, Küpfer P, Mansion G, Negrini R, Paun O, Pellicchia M, Rioux D, Schüpfer F, Van Loo M, Winkler M, Gugerli F & INTRABIODIV consortium (incl. NE Zimmermann) 2009. History or ecology? Substrate type as a major driver of spatial genetic structure in Alpine plants. *Ecology Letters* 12: 632–640.
- Coldea G, Stoica IA, Puțuca? M, Ursu T, Opera A & INTRABIODIV consortium (incl. NE Zimmermann) 2009. Alpine-subalpine species richness of the Romanian Carpathians and the current conservation status of rare species. *Biodiversity Conservation* 18: 1441–1458.
- Engler R, Randin CF, Vittoz P, Czaka T, Beniston M, Zimmermann NE & Guisan A, 2009. Predicting future distributions of mountain plants under climate change: does dispersal capacity matter? *Ecography* 32: 34–45.
- Galley C, Linder HP & Zimmermann NE, 2009. *Pentstemon* (Poaceae) diversity in the Cape mediterranean region: habitat heterogeneity and climate stability. *Global Ecology and Biogeography* 15(6): 1557–1569.
- Kaplan JO, Krummhardt KM & Zimmermann NE, 2009. The prehistoric and preindustrial deforestation of Europe. *Quaternary Science Review* 28: 3016–3034.
- Mathys L, Guisan A, Kellenberger TW & Zimmermann NE, 2009. Evaluating effects of spectral training data distribution on continuous field mapping performance. *ISPRS Journal of Photogrammetry and Remote Sensing* 64: 665–673.
- Nobis MP, Jaeger JAG & Zimmermann NE, 2009. Neophyte species richness at the landscape scale under urban sprawl and climate warming. *Diversity and Distribution*, 15: 928–939.
- Rammig A, Jonas T, Zimmermann NE & Rixen C, 2009. Changes in alpine plant growth under future climate conditions. *Biogeosciences*. 6: 10817–10847.
- Randin CF, Engler R, Normand S, Zappa M, Zimmermann NE, Pearman PB, Vittoz P, Thuiller W & Guisan A, 2009. Climate change and plant distribution: local models predict high-elevation persistence. *Global Change Biology* 15(6): 1557–1569.
- Steinmann K, Linder HP & Zimmermann NE, 2009. Modelling species richness using functional groups. *Ecological Modelling* 220: 962–967.
- Thiel-Egenter C, Holderegger R, Brodbeck S & INTRABIODIV consortium (incl. NE Zimmermann) 2009. Concordant genetic breaks, identified by combining clustering and tessellation methods, in two co-distributed alpine plant species. *Molecular Ecology* 18: 4507–4275.
- Zimmermann NE, Yoccoz NG, Edwards TC, Jr, Meier ES, Thuiller W, Guisan A, Schmatz DR & Pearman PB, 2009. Climatic extremes improve predictions of spatial patterns of tree species. *Proc. Nat. Acad. Sci. USA* 106: 19723–19728.
- 2008**
- Gehrig-Fasel J, Guisan A & Zimmermann NE, 2008. Evaluating thermal treeline indicators based on air and soil temperature using an air-to-soil transfer model. *Ecological Modelling* 213(3–4): 345–355.
- Graham CH, Elith J, Hijmans RJ, Guisan A, Loiselle BA & the NCEAS species distribution modelling group (incl. NE Zimmermann) 2008. The influence of spatial errors in species occurrence data used in distribution models. *Journal of Applied Ecology* 45: 239–247.
- Gugerli F, Englisch T, Nikföld H, Tribsch A, Mirek Z, Ronikier M, Zimmermann NE, Holderegger R, Taberlet P & IntraBioDiv consortium, 2008. Relationships among levels of biodiversity and the relevance of intraspecific diversity in conservation – a project synopsis. *Perspectives in Plant Ecology, Evolution and Systematics*, 10(4): 259–281.
- Huber S, Kneubühler M, Psomas A, Itten KI & Zimmermann NE, 2008. Estimating foliar biochemistry from hyperspectral data in mixed forest canopy. *Forest Ecology and Management* 256: 491–501.
- Kneubühler M, Koetz B, Huber S, Zimmermann NE & Schaepman ME, 2008. Space-based spectro-directional Measurements for the Improved Estimation of Ecosystem Variables. *Canadian Journal of Remote Sensing* 34(3): 192–205.
- Paun O, Schönswetter P, Winkler M & INTRABIODIV consortium (incl. NE Zimmermann) 2008. Historical divergence vs. contemporary gene flow: evolutionary history of the calcicole *Ranunculus alpestris* group (*Ranunculaceae*) in the European Alps and the Carpathians. *Molecular Ecology* 17: 4263–4275.
- Pearman PB, Randin CF, Broennimann O, Vittoz P, van der Knaap WO, Engler R, Le Lay G, Zimmermann NE, Guisan A, 2008. Testing predictions of change in plant-species distributions across six millennia. *Ecology Letters* 11: 357–369.
- Rutherford GN, Bebi P, Edwards PJ & Zimmermann NE, 2008. Assessing land-use statistics to model land cover change in a mountainous landscape in the European Alps. *Ecological Modelling* 212: 460–471.
- Thuiller W, Albert C, Araujo MB, Berry PM, Cabeza M, Guisan A, Hickler T, Midgley GF, Paterson J, Schurr FM, Sykes MT, Zimmermann NE, 2008. Predicting global change impacts on plant species' distributions: Future challenges. *Perspectives in Plant Ecology, Evolution and Systematics* 9: 137–152.
- Wisz MS, Hijmans RJ, Li J, Peterson AT, Graham CH, Guisan A & the NCEAS species distribution modelling group (incl. NE Zimmermann) 2008. Effects of sample size on the performance of species distribution models. *Diversity and Distributions*: 14, 763–773.
- 2007**
- Ehrich D, Gaudeul M, Assefa A, Koch MA, Mummenhoff K, Nemomissa S, Brochmann C & INTRABIODIV consortium (incl. NE Zimmermann) 2007. Genetic consequences of Pleistocene range shifts: contrast between the Arctic, the Alps and the East African mountains. *Molecular Ecology* 15: 2542–2559.
- Gehrig-Fasel J, Guisan A & Zimmermann NE, 2007. Treeline shifts in the Swiss Alps: Climate Change or Land Abandonment? *Journal of Vegetation Science* 18: 571–582.
- Gellrich M, Baur P, Koch B & Zimmermann NE, 2007. Agricultural land abandonment and natural forest re-growth in the Swiss mountains: A spatially explicit economic analysis. *Agriculture, Ecosystems and Environment* 118: 93–108.
- Gellrich M, Baur P & Zimmermann NE, 2007. Natural forest regrowth as a proxy variable for agricultural land abandonment in the Swiss mountains: a spatial statistical model based on geophysical and socio-economic variables. *Environmental Modelling and Assessment* 12: 93–108.
- Gellrich M, & Zimmermann NE, 2007. Investigating the regional-scale pattern of agricultural land abandonment in the Swiss mountains: A spatial statistical modelling approach. *Landscape and Urban Planning* 79: 65–76.
- Guisan A, Zimmermann N.E., Elith J., Graham C, Phillips S & Peterson AT, 2007. What matters for predicting the occurrences of trees: techniques, data, or species' characteristics? *Ecological Monographs* 77(4): 615–630.
- Guisan A, Graham C, Elith J, Huettman, F. & the NCEAS species distribution modelling group (incl. NE Zimmermann) 2007. Sensitivity of predictive species distribution models to change in grain size: insights from a multi-models experiment across five continents: *Diversity and Distribution* 13: 332–340.
- Leyk S & Zimmermann NE, 2007. Improving land cover change analysis based on uncertain survey maps: predictive map correction and area estimations using Fuzzy Sets. *Landscape Ecology* 22: 257–272.
- Rickebusch S, Gellrich M, Lischke H, Guisan A & Zimmermann NE, 2007. Combining probabilistic land-use change and forest dynamics modelling to simulate global change responses at the Alpine tree-line. *Ecological Modelling* 209(2–4): 157–168.
- Rickebusch S, Lischke H, Bugmann H, Guisan A & Zimmermann NE, 2007. Understanding the low-temperature limitations to forest growth through calibration of a forest dynamics model with tree-ring data. *Forest Ecology and Management* 246: 251–263.
- Rutherford GN, Guisan A & Zimmermann NE, 2007. Evaluating sampling strategies and logistic regression methods for modelling complex land cover changes. *Journal of Applied Ecology* 44: 414–424.

- Shiyatov SG, Terent'ev MM, Fomin VV & Zimmermann NE, 2007. Altitudinal and Horizontal Shifts of the Upper Boundaries of Open and Closed Forests in the Polar Urals in the 20th Century. *Russian Journal of Ecology* 38(4): 223-227.
- Thornton PE & Zimmermann NE, 2007. An improved canopy integration scheme for a land surface model with prognostic canopy structure. *Journal of Climate*, 20: 3902-3923.
- Zimmermann NE, Edwards TC, Jr, Moisen GG, Frescino TS & Blackard JA, 2007. Remote sensing-based predictors improve distribution models of rare, early successional and broadleaf tree species in Utah. *Journal of Applied Ecology*, 44: 1057-1067.
- 2006**
- Cunningham C, Bugmann H, Zimmermann NE & Stöckli V 2006. Growth response of Norway spruce saplings in two forest gaps in the Swiss Alps to artificial browsing, infection with black snow mold, and competition by ground vegetation. *Canadian Journal of Forestry Research* 36: 2782-2793.
- Cunningham C, Bugmann H, Zimmermann NE & Stöckli V 2006. Growth of Norway spruce (*Picea abies* L.) saplings in subalpine forests in Switzerland: Does spring climate matter? *Forest Ecology and Management* 228(1-3): 19-32.
- Edwards TC Jr, Cuttler R, Zimmermann NE, Geiser L & Moisen GG 2006. Effects of sample survey design on the accuracy of classification tree models in species distribution models. *Ecological Modelling* 199: 132-141.
- Elith J, Graham CH, Anderson RP, Dudik M, Ferrier S, Guisan A, Hijmans RJ, Huettmann F, Leathwick J, Lehmann A, Li J, Lohmann LG, Loiselle BA, Manion G, Moritz C, Nakamura M, Nakazawa Y, Overton JM, Peterson AT, Phillips SJ, Richardson K, Scachetti-Pereira R, Schapire R, Soberón J, Williams S, Wisz MS & Zimmermann NE 2006. Novel methods improve prediction of species' distributions from occurrence data. *Ecography* 29: 129-151.
- Guisan A, Broennimann O, Vust M, Yoccoz NG, Lehmann A & Zimmermann NE 2006. Using niche-based distribution models to improve the sampling of rare species. *Conservation Biology*, 20(2): 501-511.
- Lischke H, Zimmermann NE, Bolliger J, Rickebusch S, Löffler TJ 2006. TreeMig: A forest-landscape model for simulating spatio-temporal patterns from stand to landscape scales. *Ecological Modelling* 199: 409-420.
- Maggini R, Lehmann A, Zimmermann NE & Guisan A 2006. Improving generalized regression analysis for spatial predictions of forest communities. *Journal of Biogeography* 33: 1729-1749.
- Mathys L, Zimmermann NE, Zbinden N & Suter W, 2006. Identifying habitat suitability for hazel grouse *Bonasa bonasia* at the landscape scale. *Wildlife Biology*, 12(4), 357-366.
- Mathys L, Ginzler C, Zimmermann NE, Brassel P & Wildi O 2006. Sensitivity assessment on continuous landscape variables to classify a discrete forest area. *Forest Ecology and Management* 229(1-3): 111-119.
- Moisen GG, Freeman EA, Blackard JA, Frescino TS, Zimmermann NE & Edwards TC Jr. 2006. Predicting tree species presence and basal area in Utah: A comparison of stochastic gradient boosting, generalized additive models, and tree-based methods. *Ecological Modelling* 199: 176-187.
- Randin CF, Dimböck T, Dullinger S, Zimmermann NE, Zappa M & Guisan A 2006. Are niche-based species distribution models transferable in space? *Journal of Biogeography* 33, 1689-1703.
- 2005**
- Dobbertin M, Mayer P, Wohlgenuth T, Feldmeyer-Christe E, Graf U, Zimmermann, NE & Rigling A, 2005. The decline of *Pinus sylvestris* L. forests in the Swiss Rhone valley - a result of drought stress? *Phyton – Annales Rei Botanicae* 45: 153-156.
- Jolly WM, Dobbertin M, Zimmermann NE & Reichstein M, 2005. Divergent vegetation growth responses to the 2003 heat wave in the Swiss Alps. *Geophysical Research Letters* 32: L18409.
- Edwards TC Jr, Cuttler R, Zimmermann NE, Geiser L & Alegria J, 2005. Model-based stratifications for enhancing the detection of rare ecological events: Lichens as a case study. *Ecology* 86(5): 1081-1090.
- Dobbertin M, Hilker N, Rebetez M, Zimmermann NE, Wohlgenuth T & Rigling A, 2005. The upward shift in altitude of pine mistletoe (*Viscum album* ssp. *austriacum*) in Switzerland - the result of climate warming? *International Journal of Biometeorology* 50: 40-47.
- Schaub M, Zimmermann NE, Kräuchi N, 2005. Temporal and spatial variation of Vcmax within a Swiss beech canopy. *International Forestry Review* 7(5): 96.
- Schwarz M & Zimmermann NE, 2005. A new GLM-based method for mapping tree cover continuous fields using MODIS reflectance data. *Remote Sensing of the Environment* 95: 428-443.
- 2004 and earlier**
- Schwarz M, Zimmermann NE, Wildi O & Kienast F, 2004. Erfassen kontinuierlicher Bodenbedeckungsdaten anhand von MODIS Daten in der Schweiz. *Botanica Helvetica* 114(2): 151-167.
- Leyk S & Zimmermann NE, 2004. A predictive uncertainty model for field-based survey maps using Generalized Linear Models. *Lecture Notes in Computer Science*, LNCS 3234, pp. 191-205.
- Powell JA & Zimmermann NE, 2004. Multi-scale analysis of seed dispersal and the resolution of Reid's Paradox. *Ecology* 85(2): 490-506.
- Price DT, Zimmermann NE, van der Meer PJ, Lexer MJ, Leadley P, Jorritsma ITM, Schaber J, Clark DF, Lasch P, McNulty S, Wu J & Smith B, 2001. Regeneration in gap models: Priority issues for studying forest response to global change. *Climatic Change* 51(3/4): 475-508.
- Schloeder CA, Zimmermann NE & Jacobs MJ, 2001. Comparison of methods for interpolating soil properties using limited data. *Soil Science Society of America Journal* 65(2): 470-479.
- Guisan A & Zimmermann, NE, 2000. Predictive habitat distribution models in ecology. *Ecological Modelling* 135(2-3): 147-186.
- Zimmermann NE & Kienast F, 1999. Predictive mapping of alpine grasslands in Switzerland: species versus community approach. *Journal of Vegetation Science* 10(4): 469-482.
- B. Book and Book chapters**
- Elbakidze M, Hahn T, Zimmermann NE, Cudlín P, Friberg N, Genovesi P, Guarino R, Helm A, Jonsson BG, Lengyel S, Leroy B, Luzzati T, Milbau A, Pérez-Ruzafa A, Roche P, Roy H, Vanbergen A, Vandvik V, Sabyrbekov R, 2018. *Direct and indirect drivers of change in biodiversity and nature's contributions to people*. In: IPBES, Chapters of the regional assessment report on biodiversity and ecosystem services for Europe and Central Asia of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Bonn, pp. 549-809.
- IPBES, 2018. *Summary for policymakers of the regional assessment report on biodiversity and ecosystem services for Europe and Central Asia of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Fischer M, Rounsevell M, Torre-Marín Rando A, Mader A, Church A, Elbakidze M, Elias V, Hahn T, Harrison PA, Hauck J, Martín-López B, Ring I, Sandström C, Sousa Pinto I, Visconti P, Zimmermann NE & Christie M (eds.). IPBES secretariat, Bonn, Germany. 48 pages.
- Guisan A, Thuiller W & Zimmermann NE, 2017. *Habitat suitability and distribution models – with applications in R*. Cambridge University Press, 462 pp.
- Madrigal-González J, Ruiz-Benito P, Ratcliffe S, Rigling A, Wirth C, Zimmermann NE, Zweifel E & Zavala MA, 2017. *Competition Drives Oak Species Distribution and Functioning in Europe: Implications Under Global Change*. In: Gil-Pelegrín E, Peguero-Pina JJ, Sancho-Knapik D (eds), Oaks physiological ecology. Exploring the functional diversity of genus *Quercus* L., Vol. 7, Springer, pp. 513-538.
- Clark JS, Iverson L, Woodall CW, Allen CD, Bell DM, Bragg D, D'Amato AW, Davis FW, Hersh M, Ibanez I, Jackson ST, Matthews S, Pederson N, Peters M, Schwartz M, Waring K & Zimmermann NE, 2016. Impacts of increasing drought on forest dynamics, structure, and biodiversity. In: Vose JM, Clark JS, Luce CH, Patel-Wynand T (eds.), *Effects of Drought on Forests and Rangelands in the United States: A Comprehensive Science Synthesis*. Gen. Tech. Rep. WO-93b. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office, pp. 59-96
- Meier ES & Zimmermann NE, 2016. *Importance of species competition and migration limitation for tree distributions during global change*. In: Krumm F, Vítková L (eds.), Introduced tree species in European forests: opportunities and challenges. European Forest Institute, pp. 226-235.
- Remund J, von Arx G, Gallien L, Rebetez M, Huber B & Zimmermann NE, 2016. *Klimawandel in der Schweiz - Entwicklung walddrelevanter Klimagrößen*. In: Plüss AR, Augustin S, Brang P (eds.), Wald im Klimawandel; Grundlagen für Adaptationsstrategien. Haupt, Bern, pp. 199-221.
- Wohlgenuth T, Gallien L & Zimmermann NE, 2016. *Verjüngung von Buche und Fichte im Klimawandel*. In: Plüss AR, Augustin S, Brang P (eds.), Wald im Klimawandel; Grundlagen für Adaptationsstrategien. Haupt, Bern, pp. 115-135.
- Zimmermann NE, Schmatz DR, Gallien L, Körner, Huber B, Frehner M, Küchler & Psomas A, 2016. *Baumartenverbreitung und Standorteignung*. In: Plüss AR, Augustin S, Brang P (eds.), Wald im Klimawandel; Grundlagen für Adaptationsstrategien. Haupt, Bern, pp. 23-37.
- Bugmann HKM, Brang P, Elkin C, Henne P, Jakob O, Lévesque M, Lischke H, Psomas A, Rigling A, Wermelinger B & Zimmermann NE, 2014. *Climate change impacts on tree species, forest properties, and ecosystem services*. In: Raible CC, Strassmann KM (eds.), CH2014-Impacts: Toward Quantitative Scenarios of Climate Change Impacts in Switzerland, pp. 79-89. Berne, Switzerland: OCCR, FOEN, MeteoSwiss, C2SM, AGROSCOPE, PROCLIM.
- Pearman PB, Zimmermann NE, Guisan A, Psomas A & Schmatz DR, 2014. *Impacts on the biodiversity of widely distributed birds and vascular plants*. In: Raible CC, Strassmann KM (eds.), CH2014-Impacts: Toward Quantitative Scenarios of Climate Change Impacts in Switzerland, pp. 69-77. Berne, Switzerland: OCCR, FOEN, MeteoSwiss, C2SM, AGROSCOPE, PROCLIM.
- Zimmermann NE, Washington-Allen RA, Ramsey RD, Schaeppman ME, Mathys L, Kötz B, Kneubühler M, Edwards TC, Jr., 2007. *Modern remote sensing for environmental monitoring of landscape states and trajectories*. In: Kienast F, Wildi O, Ghosh S (eds.), A

- changing world - challenges for landscape research. Springer Landscape Series vol. 8. Springer, Dordrecht, The Netherlands, pp. 65-91.
- Lischke H, Löffler, T.J, Thornton PE & Zimmermann NE, 2007. Model up-scaling in landscape research. In: Kienast F, Wildi O, Ghosh S (eds.), *A changing world - challenges for landscape research*. Springer Landscape Series vol. 8. Springer, Dordrecht, The Netherlands, pp. 249-272.
- Zimmermann NE, Bolliger J, Gehrig-Fasel J, Guisan A, Kienast F, Lischke H, Rickebusch S & Wohlgemuth T, 2006. *Wo wachsen die Bäume in 100 Jahren?* In: T Wohlgemuth (ed.), Wald und Klimawandel. Forum für Wissen 2006. WSL, Birmensdorf, Schweiz. ISSN 1021-2256, pp. 63-71.
- ### C. Non-ISI Papers or Reports with Peer Review
- Zimmermann NE, Normand S & Psomas A, 2014. PorTree Final Report - Environmental Portfolio of Central European Tree Species. WSL, Birmensdorf, Switzerland, 24pp.
- Wohlgemuth T, Brang P, Bugmann H, Rigling A & Zimmermann NE, 2014. Forschung zu Wald und Klimawandel in Mitteleuropa: eine Werkschau. *Schweizerische Zeitschrift für das Forstwesen* 165: 27-36.
- Gugerli F, Zimmermann NE & Holderegger R, 2013. Genetische Vielfalt - Die Alpen als Barriere und Schmelztiegel. *Hotspot* 27: 12-13.
- Dawson MN, Algar AC, Antonelli A, Dávalos LM, Davis E, Early R, Guisan A, Jansson R, Lessard J-P, Marske KA, McGuire J, Stigall AL, Swenson NG, Zimmermann NE & Gavin DG, 2013. An horizon scan of biogeography. *Frontiers of Biogeography* 5(2): 130-157.
- Lenoir J, Svenning J-C, Dullinger S, Pauli H, Willner W, Guisan A, Vittoz P, Wohlgemuth T, Zimmermann NE, Gégout J-C, 2012. The Alps Vegetation Database – a geo-referenced community-level archive of all terrestrial plants occurring in the Alps. *Biodiversity & Ecology* 4: 331–332.
- Zimmermann NE 2010. Biodiversität im Zeichen des Klimawandels. *Hotspot* 21: 18-19.
- Zimmermann NE 2009. More uncertainty with BIOMOD. *Frontiers of Biogeography* 1(2): 38-39.
- Rigling A, Brang P, Bugmann H, Kräuchi N, Wohlgemuth Th, Zimmermann NE, 2008. Klimawandel als Prüfstein für die Waldbewirtschaftung. *Schweizerische Zeitschrift für das Forstwesen* 10: 316-325.
- Zimmermann NE, Bugmann H, 2008. Die Kastanie im Engadin – oder was halten Baumarten von modellierten Potenzialgebieten? *Schweizerische Zeitschrift für das Forstwesen* 10: 326-335.
- Psomas A, Kneubühler, Itten KI & Zimmermann NE, 2007. Hyperspectral remote sensing for seasonal estimation of aboveground biomass in grassland habitats. Extended Proceedings of the 10th International Symposium on Physical Measurements and Signatures in Remote Sensing in Davos, Switzerland 2007.
- Rickebusch S, Zimmermann NE & Lischke H, 2005. Simulating climate and land-use change scenarios at the Alpine tree-line ecotone, using a dynamic forest landscape model. Proceedings of the Open Science Conference on Global Change in Mountain Regions, Perth (UK), 2-6 October 2005.
- Huber S, Kneubühler M, Zimmermann NE & Itten KI, 2005. Potential of imaging spectrometry to retrieve ecosystem characteristics within mixed forest canopies. Proceedings of the 4th EARSEL Conference on Imaging Spectroscopy in Warsaw, Poland 2005.
- Huber S, Zimmermann NE, Kneubühler M, Psomas A & Itten KI, 2005. Estimating Nitrogen in Mixed Forests from HyMap Data using Band-Depth Analysis and Branch-and-Bound Algorithm. Proceedings of the 9th International Symposium on Physical Measurements and Signatures in Remote Sensing, 17-19 October, Beijing, China 2005, pp. 533.
- Psomas A, Zimmermann NE, Kneubühler M, Kellenberger T & Itten KI, 2005. Seasonal variability in spectral reflectance for discriminating grasslands along a dry-mesic gradient in Switzerland. Proceedings of the 4th EARSEL Conference on Imaging Spectroscopy in Warsaw, Poland 2005.
- Kienast F, Wildi O & Zimmermann NE, 2004. Mögliche Auswirkungen der Klimaänderung auf die Baumartenverbreitung in der Schweiz. Antworten mit Hilfe von Modellen. - Local Land Soil News 9/1: 7-8.
- Mathys LM, Zimmermann NE & Guisan A, 2004. Spatial pattern of forest resources in a multifunctional landscape. International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences, Vol. XXXVI - 8/W2: 340-342.
- Schaeppman ME, Koetz B, Schaeppman-Strub G, Zimmermann NE & Itten KI, 2004. Quantitative retrieval of bio-geophysical characteristics using imaging spectroscopy: a mountain forest case study. *Community Ecology* 5: 93-104.
- Schwarz M & Zimmermann NE, 2004. MODIS based regionally optimized continuous fields of tree cover using generalized linear models. Proceedings of the IGARRS 2004 conference in Vancouver, Canada, 2004.
- Wildi O, Feldmeyer-Christe E, Ghosh S & Zimmermann NE, 2004. A comment on vegetation monitoring approaches. *Community Ecology* 5: 1-5.
- Waser L, Zimmermann NE & Schwarz M, 2003. Landcoverdaten unter der Lupe. Inf.bl. Forsch.bereich Landsch.ökol., WSL 56:1-4.
- Wohlgemuth T, Eggenberg S, Favre P, Hollenstein H-U, König Umi K, Pauli D, Zimmermann NE, 2002. Farn- und Blütenpflanzen. In: Hänggi A, Müller JP (eds): Eine 24-Stunden Aktion zur Erfassung der Biodiversität auf der Alp Flix (Graubünden): Methoden und Resultate. Jahresber. Nat.forsch. Ges. Graubünden 110: 15-17
- Bolliger J, Kienast F & Zimmermann NE, 2000. Risks of global warming on montane and subalpine forests of Switzerland - a modeling case study. *Regional Environmental Change* 1(3-4): 99-111.
- Kienast F, Zimmermann NE & Wildi O, 2000. Évolution possibles des aires de répartition des principales essences forestières en fonction des scénarios de changement climatique. *Revue forestière française* 52, numéro spécial 2000: 119-126.