Valentine HERRMANN

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EDUCATION

2012-2013: 1st year degree in **Mathematics** – *La Rochelle University, 23 Avenue Albert Einstein, 17000 La Rochelle, France.*

June 2012: MS in **Ecology & Ethology** (with high honors) –*Jean Monnet University, 10 Rue Tréfilerie, 42100 Saint-Etienne, France.*

June 2010: BS in **Environmental Geography** (with honors). *European Institute of Rural Resources Management – Jean Moulin Lyon III University, 6 Cours Albert Thomas, 69008 Lyon, France.*

June 2009: Technical Degree in **Nature Management and Conservation** (with honors) – *Institute of Environment and Technologies, 47 Rue du Sergent Michel Berthet, 69009 Lyon, France.*

EMPLOYMENT

June 2017 to present: **Data analyst: on demand analytical support (R programing) for various research programs.** *Smithsonian Conservation Biology Institute – 1500 Remount Road, Front Royal, USA, VA 22630.*

- **Automated QAQC**: implementation of continuous integration via GitHub action for real-time data QAQC and production of reports, statistics, summaries, and figures
- Alliance for Tropical Forest Science (ATFS): develop of a data harmonization app and associated R package.
- eMammal to WildlifeInsights: assistance in the migration of data via API and JSON mapping configuration.
- **Free-roaming domestic cats**: estimate drivers of abundance of free-roaming cats with random thinning spatial-capture-recapture (rtSCR) modeling in the district of Columbia (DC) using data from camera traps.
- **IPCC**: development of an R pipeline to convert ForC measurements into EFDB (Emission Factor Database) data entry form.
- **Tree core modeling:** develop a new method to simultaneously model nonlinear effects of primary climate drivers, reconstructed tree diameter at breast height (DBH), and year while accounting for the temporal autocorrelation inherent to each individual tree's growth.
- **Disease vector species:** species distribution modeling (SDM) of ticks and mosquitoes in Africa
- **Loggerhead Shrike:** SDM using eBird checklists across 20 states in the southeast USA
- **Invasive plant species:** SDM integrating frameworks to (1) pool survey and collection data for multiple species and (2) model the potential and realized distribution of invasive species within invaded range.
- **Grassland birds:** understand effect of land management activities on wintering and breeding bird occupancy and species richness
- **eMammal:** create and/or fix R scripts producing figures of activity pattern, occupancy, species co-occurrence, diversity indices, species accumulation curves and other descriptive summaries to the online user interface.
- **ForestGEO:** creation of data management tool to create standardized data files across the network
- **Forest Carbon:** curation of the ForC database and its associated Shiny app
- **Landscape dynamics:** adapt and develop R scripts to expand existing analysis to additional landscape patch transitions and to automate GIS work originally operated by hand in ArcMap.
- **Tree cores:** analysis of tree-ring chronologies across 109 years of monthly climatic variations for 14 tree species of northern Virginia, USA.
- **American Chestnut:** survival analysis of seedlings under different planting scenarios
- **Cats and bird kills in DC:** GIS work to define a sampling strategy for camera trapping looking at different aspects of the city (development density, parks, income…)

- **Asian ungulate diet:** examine and compare the diet composition of eight ungulate species in a dry tropical forest (data coming from metabarcoding of fecal samples).
- **Understory plant community:** investigate effect of deer exclusion and exotic plant removal on understory community in a temperate forest.
- **Acoustic monitoring:** minor help to automate reading of acoustic files into R
- **Virginia Working landscapes:** support for the analysis of plant survey data and development of a Shiny App for report visualizations by stake holders.
- **Human-Elephant Conflict:** analysis of survey data on human perceptions of Elephant.
- **Insect pathogens:** analytical work to investigate the long-term impact of exotic insects and pathogens on the forests of Virginia's Blue Ridge Ecoregion
- **Tree hydraulic traits:** curation and analysis of data collected on leaf structure and hydraulic traits in relation to species productivity and population dynamics.
- **Beetle and Wasp community:** quantifying impacts of fossil fuel exploration on beetle and wasp communities in the Peruvian Amazon
- **Ticks:** analytical assistance to examine tick burdens in a small mammal community in Virginia, USA

2015 to 2017: **Contractor – Forest Ecology and Climate Lab.** *Smithsonian Conservation Biology Institute – 1500 Remount Road, Front Royal, USA, VA 22630.*

- **Tree growth:** R programming for data management and analysis of remote sensing data from automated dendrometer bands
- **Water Use:** R programming for data management and analysis of automated measurement of sap flow
- **Tree size contribution to Carbon cycle:** R programming for curation, management, and analysis of global network data (ForestGEO) and ForC database

2014 to 2015: ***Intern*** **– Forest Ecology and Climate Lab.** *Smithsonian Conservation Biology Institute – 1500 Remount Road, Front Royal, USA, VA 22630.*

- **Tree growth:** Running, maintaining, and testing of automated dendrometer bands (TreeHuggers)
- **Water Use:** Running and maintaining automated measurement of sap flow (Probes)

2012- 2014: **Research Ecologist.** *BioSphère Environnement non-profit organisation – 52 Quai de l'Estuaire, 17120 Mortagne-sur-Gironde, France.*

- **Reedbed passerines** post-breeding migration
  - Capture-mark-recapture (mist-net)
  - VHF radio-telemetry monitoring
  - Banding field camps (1.5 month every year)
  - Training and supervising interns/volunteers (up to 10) for field work (mist-netting and radiotelemetry)
  - Data entry and management
  - Data analyses with MARK and Ranges (Anatrack Ltd) programs
- **Bluethroat** surveys
  - Building distance sampling protocol
  - Supervising intern for field work
  - Analyses: comparison of densities for 3 different sites with DISTANCE program
  - Capture-mark-recapture (mist-net)
  - Molt study
  - Diet study (collecting drops)
- Wintering **European Curlew** survey
  - Capture-mark-recapture (loop trap)
  - VHF radio-telemetry monitoring
- Other assignments
  - Training professionals in radiotelemetry (cf. teaching experience)
  - Education and outreach (cf. teaching experience)
  - Website development
  - Creation of project display posters
  - Project accounting

RESEARCH EXPERIENCE

Spring and summer 2011and 2012: **Characterization of the Aquatic Warbler ecology during its stopover at Gironde Estuary.** *Master thesis. BioSphère Environnement non-profit organisation – Mortagne-sur-Gironde, France.*

- Optimization of sampling strategy by comparing survival, detection probability and transience on three sites of the Bay of Biscay (CMR, MARK and E-SURGE programs)
- Identification of exploited habitats (radiotelemetry + Ranges program)
- Study of food availability (arthropod sampling, identification, and biomass calculations)
- Diet study (from fecal samples)

Summer 2010: **Study of the importance of the Gironde Estuary for reedbed passerines during their post-breeding migration.** 3-month *internship. BioSphère Environnement non-profit organisation – Mortagne-sur-Gironde, France.*

- Radiotelemetry + supervising radio-telemetry program
- Mist-netting and banding
- Assessment of human activities and threats

Spring 2008: **Ecological survey and management plan development for Crépieux-Charmy water catchment site.** *3-month internship. Veolia Eau – Lyon, France.*

- Faunal, floral, and abiotic classification
  - Protocol development and data collection
- Development of a 5-year management plan
  - Mapping and merging data layers
  - Highlighting challenges and threats
  - Proposing management measures
  - Mapping, planning, and costing the measures
  - Presenting the report to the technical committee

ADDITIONAL TRAINING

*2021-2023: Participation in **Bayesian analysis** discussion and practice group (every other week)*

February 2019: 2-day **Carpentries Instructor Training**. *Online.*

February 2019: 2-day **Data Carpentry workshop** on reproducible data analysis using Excel, OpenRefine, Python, and SQL. *Smithsonian Institution – Washington, DC, USA*

May 2017: 2-day course on "**Analyzing animal tracking data:** Track annotation, visualization & analysis using Movebank and R". *North Carolina Museum of Natural Sciences – Raleigh, NC, USA*

February 2017and February 2018: Teaching *assistant* in **"Statistics for Ecology and Conservation Biology"** 2-week *course. Smithsonian-Mason School of Conservation - Smithsonian Conservation Biology Institute – Front Royal, USA, VA.*

- Probability Theory, Statistical Distributions, Linear models, Diagnostics, Generalized linear models, random effects, Simulations…

April 2013: 2-week course in **"Estimating Animal Abundance and Occupancy"**. *Smithsonian-Mason School of Conservation - Smithsonian Conservation Biology Institute – Front Royal, USA, VA.*

- Distance sampling, capture-mark-recapture, and occupancy modeling techniques (DISTANCE, MARK, and PRESENCE programs)

March 2012: 1-week course in **"Modeling individual histories with state uncertainty"**. *Center for Evolutionary and Functional Ecology – Montpellier, France.*

- Capture-mark-recapture analyses using multievent models (E-SURGE program)

TEACHING EXPERIENCE

March 2019 and March 2020: Instructor in **"Statistics for Ecology and Conservation Biology"** 2-week *course. Smithsonian-Mason School of Conservation - Smithsonian Conservation Biology Institute – Front Royal, USA, VA.*

- Regression-based statistical analysis for ecological research and conservation biology, using the R software environment. (Probability Theory, Statistical Distributions, Linear models, Diagnostics, Generalized linear models, random effects, Simulations…)

August 2016 and May 2015: Teaching *assistant* in **"Estimating Animal Abundance and Occupancy"** *course. Smithsonian-Mason School of Conservation - Smithsonian Conservation Biology Institute – Front Royal, USA, VA.*

- Distance sampling data analysis in program DISTANCE

May and June 2010, 2011, 2012 and 2013: **Science popularization**. *Lead guide for at least two 1-week "science discovery" classes per year and some one-day field activities. Massif Central, France. Audience ages 6 to 13 in both English and French.*

- Topics included:
  - The landscape of the Massif Central (ecological succession, pedogenesis, peat bog formation)
  - Water quality (arthropod sampling and ID, indicators, and pollutants)
  - Volcanoes of the Chaîne des Puys
  - Development of interactive learning games

11th & 12th July 2011: **Radio-telemetry training**. *France. Audience: professionals and interns in field ecology.*

- Teaching assistant in courses about radio-telemetry theory and data analysis
- Teaching technical aspects of radiotelemetry (material, strategies, echo, and corridors)

VOLUNTEERING

March 2014: ***Forest ecology.*** *Smithsonian Conservation Biology Institute – Front Royal, USA, VA.*

- Helping with local data collected at the Center for Tropical Forest Science (CTFS)-ForestGEO plot at SCBI
- Mapping understory species, status of trees, habitat type, mean elevation, basal area
- Field work: measuring dendrobands in the plot

February 2014: ***Activity patterns of large carnivores.*** *Smithsonian Conservation Biology Institute – Front Royal, USA, VA.*

- Helping with data analyses
- Intra-species analyses: does urbanization, moon stage or presence of other species affect the activity patterns?
- Inter-species analyses: are species temporally avoiding each-other?
- Main studied species: American Black Bear, Coyote, Bobcat, Red Fox, and Gray Fox
- Main tool used: 'overlap' R package

SOFTWARE SKILLS

Programming: fluent in R, comfortable in SQL, Jags/BUGS language and NIMBLE, exposed to MATLAB, Python, JavaScript, C++, Bash, JSON

Version control: Git (most often through GitHub, RStudio and GitHub Desktop)

Population modeling and abundance estimation: Mark, Distance, U-Care, Close-Test, SODA, E-Surge, Presence. (Now all supported in various R packages)

GIS/Mapping: R, ArcGIS, QGis, gvSIG, MapInfo, Ranges.

Website/Application development: HTML, CSS, R markdown, RShiny

Others: Word, Excel, Power Point, Access.

PUBLICATIONS

h-index: 15; i10-index: 17; Citations: 861 (see my GoogleScholar for latest)

2023

1. Fergus C., Lacher I.L., **Herrmann V.**, McShea W.J., Akre T.S. (2023) Predicting vulnerability of forest patches to invasion by non-native plants for landscape scale management. Ecological Applications, e2857, https://doi.org/10.1002/eap.2857
2. Cove M.V., **Herrmann V.**, Herrera D.J., Augustine B. C., Flockhart DT.T., McShea W.J. (2023) Counting the Capital's cats: Estimating drivers of abundance of free-roaming cats with a novel hierarchical model. Ecological Applications: 33 (2): e2790, https://doi.org/10.1002/eap.2790

2022

3. Kim A.Y., **Herrmann V.**, Barreto R., Calkins B., Gonzalez-Akre E.B., Johnson D.J., Jordan J.A.; Magee L., McGregor I.R., Montero N. (2022) Implementing GitHub Actions continuous integration to reduce error rates in ecological data collection. Methods in Ecology and Evolution, 13 (11): 2572-2585.
4. Gonzalez-Akre E.B., Piponiot C., Lepore M., **Herrmann V.**, Lutz J.A, Baltzer J.L., Dick C.W., et al. (2022). allodb: An R package for biomass estimation at globally distributed extratropical forest plots. Methods in Ecology and Evolution 13: 330–338.
5. Cameron D., Anderson-Teixeira, K.J., Kim A., D'Orangeville L., Gonzalez-Akre E.B., Helcoski R., **Herrmann V.**, et al. (2022). Warm springs alter timing but not total growth of temperate deciduous trees. Nature 608 (923):552-557
6. Anderson-Teixeira, K.J., **Herrmann V.**, RollinsonC.R., Gonzalez B., Gonzalez-Akre E.B., Pederson N., Alexander R., et al. (2022). Joint effects of climate, tree size, and year on annual tree growth derived from tree-ring records of ten globally distributed forests. Global Change Biology 28: 245–266.

2021

7. McGregor I.R., Helcoski R., Kunert N., Tepley A.J., Gonzalez-Akre E.B., **Herrmann V.**, Zailaa J., Stovall A.E.L., Bourg N.A., McShea W.J., Pederson N., Sack L. and Anderson-Teixeira K.J. (2021), Tree height and leaf drought tolerance traits shape growth responses across droughts in a temperate broadleaf forest. New Phytol, 231 (2): 601-616. doi: 10.1111/nph.16996
8. Poyatos R., Granda V., Flo V., Adams M.A., Adorján B., Aguadé D., Aidar M.P. M., Allen S., Alvarado-Barrientos M.S., Anderson-Teixeira K.J., …, **Herrmann V.**, *et al.* (2021) Global transpiration data from sap flow measurements: the SAPFLUXNET database. Earth Syst. Sci. Data, 13:2607-2649. doi: 10.5194/essd-13-2607-2021, 2021.
9. Anderson-Teixeira, K.J., **Herrmann V.**, Banbury M.R., Bond-Lamberty B., Cook-Patton S.C., Ferson A.E., Muller-Landau H.C., Wang M.M.H. (2021) Carbon cycling in mature and regrowth forests globally. IOP Publishing,16 (5):53009. doi: 10.1088/1748-9326/abed01
10. Herrera D.J., Moore S.M., **Herrmann V.**, McShea W.J., Cove M.V. (2021) A shot in the dark: White and infrared LED flash camera traps yield similar detection probabilities for common urban mammal species. Hystrix, the Italian Journal of Mammalogy, 32 (1): 72-75.
11. Banbury M.R., **Herrmann V.**, Kunert N., Bond-Lamberty B., Muller-Landau H.C., Anderson-Teixeira K.J., (2021) Global patterns of forest autotrophic carbon fluxes. Global Change Biology, 27 (12):2840-2855. doi: 10.1111/gcb.15574
12. Kunert N., Zailaa J., **Herrmann V.**, Muller-Landau H.C., Wright S.J., Pérez R., McMahon S.M., Condit R.C., Hubbell S.P., Sack L. (2021) Leaf turgor loss point shapes local and regional distributions of evergreen but not deciduous tropical trees. New Phyt. 230 (2):485-496. doi: 10.1111/nph.17187
13. Xu, W., Dejid N., **Herrmann V.**, Sawyer H., Middleton A.D. (2021) Barrier Behaviour Analysis (BaBA) reveals extensive effects of fencing on wide-ranging ungulates. Journal of Applied Ecology, 58 (4):690-698. doi: 10.1111/1365-2664.13806
14. Anderson-Teixeira K.J., **Herrmann V.**, Cass W.B., Williams A.B., Paull S.J., Gonzalez-Akre E.B., Helcoski R., Tepley A.J., Bourg No.A., Cosma C.T. (2021) Long-Term Impacts of Invasive Insects and Pathogens on Composition, Biomass, and Diversity of Forests in Virginia's Blue Ridge Mountains. Springer US, 24 (1): 89-105. doi: 10.1007/s10021-020-00503-w
15. Jian J., Vargas R., Anderson-Teixeira K.J., Stell E., **Herrmann V.**, Horn M., Kholod N., Manzon J., Marchesi R., Paredes D. (2021) A restructured and updated global soil respiration database (SRDB-V5). Earth Syst. Sci. Data, 13, 255–267, https://doi.org/10.5194/essd-13-255-2021

2020

16. Cook-Patton S.C., Leavitt S.M., Gibbs D., Harris N.L., Lister, K., Anderson-Teixeira K.J., Briggs R.D., Chazdon R.L., Crowther, T.W., Ellis P.W., Griscom H.P., **Herrmann V.**, *et al*. (2020) Mapping carbon accumulation potential from global natural forest regrowth. Nature, 585 (7826):545-550. doi: 10.1038/s41586-020-2686-x
17. Ledvina J., McShea W.J., Bourg N. A., **Herrmann V.**, Akre T., Johnson A.E. (2020), Management Regime and Field Age Affect Species Richness and Cover of Native Forbs and Exotic Species in Virginia Grasslands. Ecological Rest., 20 38:83-93, doi:10.3368/er.38.2.83

Prior 2020

18. McShea W.J., Sukmasuang R., Erickson D.L., **Herrmann V.**, Ngoprasert D., Bhumpakphan N., Davies S.J. (2019), Metabarcoding reveals diet diversity in an ungulate community in Thailand. Biotropica, 51: 923– 937. https://doi.org/10.1111/ddi.12720
19. Johnson A.E., Sillett T., Luther D., **Herrmann V.**, Akre T., McShea W. (2019), Effects of grassland management on overwintering bird communities. Journal of Wildlife Management, 83: 1515-1526. doi:10.1002/jwmg.21730
20. Helcoski R., Tepley A.J., Pederson N., McGarvey J.C., Meakem V., **Herrmann V.**, Thompson J.R., Anderson-Teixeira K.J. (2019), Growing season moisture drives inter-annual variation in woody productivity of a temperate deciduous forest. New Phytol. doi:10.1111/nph.15906. PMID: 31077588.
21. Meakem V., Tepley A.J., Gonzalez-Akre E.B., **Herrmann V.**, Muller-Landau H.C., Wright S.J., Hubbell S.P., Condit R. and Anderson-Teixeira K.J. (2018), Role of tree size in moist tropical forest carbon cycling and water deficit responses. New Phytol., 219: 947-958. doi:10.1111/nph.14633.
22. Anderson-Teixeira K.J., Wang M.M.H., McGarvey J.C., **Herrmann V.**, Tepley A.J., Bond-Lamberty B., LeBauer D.S. (2018), ForC: a global database of forest carbon stocks and fluxes. Ecology, 99: 1507-1507. doi:10.1002/ecy.2229
23. Bourg N.A, McShea W.J., **Herrmann V.**, Stewart C.M. (2017), Interactive effects of deer exclusion and exotic plant removal on deciduous forest understory communities, AoB PLANTS, Volume 9, Issue 5, plx046, https://doi.org/10.1093/aobpla/plx046.
24. **Herrmann V.**, McMahon S.M., Detto M., Lutz J.A., Davies S.J., Chang-Yang C.H, Anderson-Teixeira K.J. (2016), Tree Circumference Dynamics in Four Forests Characterized Using Automated Dendrometer Bands. PLoS ONE 11(12).
25. Pepper M.A., **Herrmann V.**, Hines J.E., Nichols J.D., Kendrot S. R. (2017), Evaluation of nutria (Myocastor coypus) detection methods in Maryland, USA. Biol. Invasions 19: 831.
26. Anderson-Teixeira K. J., McGarvey J. C., Muller-Landau H. C., Park J. Y., Gonzalez-Akre E. B., **Herrmann V.**, Bennett A. C., So C. V., Bourg N. A., Thompson J. R., McMahon S. M. and McShea W. J. (2015), Size-related scaling of tree form and function in a mixed-age forest. Funct Ecol, 29: 1587–1602.
27. Musseau R., **Herrmann V.**, Bénard S., Kerbiriou C., Herault T., Jiguet F. (2014), Ecology of Aquatic Warbler *Acrocephalus paludicola* in a fall stopover area on the Atlantic coast of France. Acta Ornithologica 49 (1): 93-105.
28. Arizaga J., Andueza M., Azkona A., Dugué H., Fontanilles P., Foucher J, **Herrmann V.**, Lapios J.M., Menéndez M., Musseau R., Unamuno E., Peón P. (2014), Reed-bed use by the Aquatic Warbler Acrocephalus paludicola across the bay of Biscay during the autumn migration of 2011. Alauda 82 : 834-351.
29. Musseau R., **Herrmann V**. (2013), Gironde estuary, France: important autumn stopover site for Aquatic Warbler. Dutch Birding. 35: 15-23.
30. Musseau R., **Herrmann V**. (2011), American Yellow Warbler at Gironde estuary, France, in August 2011. Dutch Birding. 33, 322-325

LANGUAGES

French: Native language.

English: Fluent.

Spanish: Intermediate reader, beginner speaker.

REFERENCES

Available upon request