

Forschungsbericht für das Jahr 2014

Professur für Biometrie und Umwelt systemanalyse

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- Ahmed El-Gabbas
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- Holger Kröber
- Anne-Christine Mupepele
- Prof. Dr. D. Dietrich Klimetzek
- Prof. Dr. Dr. h. c. Dieter R. Pelz

Forschungsschwerpunkte

- Biometrie: Statistische Methoden in den Umweltwissenschaften, insbesondere Problemfälle der Verbreitungsanalyse (räumliche Autokorrelation, kollineare Prädiktoren)
- Statistische Ökologie: Anwendung statistischer Verfahren zur Analyse und Theoriebildung ökologischer Fragen
- Analyse und Modellierung ökologischer Netzwerke (Schwerpunkt Bestäubernetzwerke)
- Bayesische Statistik, insbesondere Anwendung in hierarchischen statistischen Modellen und zur Quantifizierung der Fehlerfortpflanzung
- Evidence-based ecosystem services: Basierung des Ökosystemare Dienstleistungskonzepts auf wissenschaftlicher Qualität, durch Einstufung der Studienlage
- Naturschutzthemen mit statistischem Bezug (etwa durch Auswertung von Datenbanken, aufwändige statistische Analysen oder kompliziertere Populationsmodelle)
- Statistische Parametrisierung von Waldmodellen; dabei geht es weniger um die Entwicklung der Waldmodelle, als mehr um die Schätzung der Modellparameter aus gemessenen Umweltdaten
- Ursachen von Artenvielfalt, von lokaler bis globaler Skala
- Verhaltensökologie von Säugetieren, insbesondere Habitatpräferenzen und Bewegungsmustern

Finanzierung

- Deutsche Forschungsgemeinschaft (DFG)
- Alexander von Humboldt-Stiftung (AvH)
- EU Framework 7
- Deutscher Akademischer Austausch Dienst e.V. (DAAD)
- EU Marie Curie
- Stipendium der Kolumbianischen Regierung

Wissenschaftliche Projekte und Forschungsvorhaben

- Dormann C.F., Kaschner K., Glaser R.: Mapping Global Risks of Anthropogenic Impacts on Marine mammals (01.10.2013 - 01.09.2017)
- Dormann CF: OPERAS - OPERATIONAL POTENTIAL OF ECOSYSTEM RESEARCH APPLICATIONS (01.12.2012 - 01.12.2017)
- Dormann CF: Shifts in the climate niche of mammals: evolutionary constraints or adaptation potential? (01.06.2011 - 01.06.2014)
- Dormann CF: The role of biodiversity in controlling biogeochemical processes under experimental climate change in grassland and forest systems. (01.06.2011 - 01.06.2014)

Wissenschaftliche Publikationen

Originalarbeiten in wissenschaftlichen Fachzeitschriften

- Allan, E., Bossdorf, O., Dormann, C.F., Prati, D., Gossner, M., Tscharntke, T., et al.: Inter-annual variation in land-use intensity enhances grassland multidiversity. P Natl Acad Sci Usa, 2014; 111: 308-313.
- Apollonio, M., De Cena, F., Bongi, P., Ciuti, S.: Female preference and predation risk models can explain the maintenance of a Fallow deer ('*Dama dama*') Lek and its 'handy' location Plos One, 2014; 9 (3): e89852.
- Avila, I.C., Alava, J.J., Galvis, C.A.: On the presence of a vagrant Juan Fernández fur seal ('*Arctocephalus philippii*') in the Pacific coast of Colombia: a new extralimital record Journal of Neotropical Mammalogy, 2014; 21 (1): 109-114.

- Benadi, G., Hovestadt, T., Poethke, H.-J., Blüthgen, N.: Specialization and phenological synchrony of plant–pollinator interactions along an altitudinal gradient. *J Anim Ecol*, 2014; 83: 639-650.
- Berberich, G., Klimetzek, D., Wöhler, C., Grumpe, A.: Statistical correlation between red wood ant sites and tectonically active fault structures *Mitt. dtsch. Ges. allg. ang. Ent*, 2014; 19: 45-50.
- Calabrese, J.M., Certain, G., Kraan, C., Dormann, C.F.: Stacking species distribution models and adjusting bias by linking them to macroecological models *Global Ecol Biogeogr*, 2014; 23: 1466-8238.
- Carvalheiro, L., Biesmeijer, J., Benadi, G., Fruend, J., Stang, M., Dormann, C.F., et al.: The potential for indirect effects between co-flowering plants via shared pollinators depends on resource abundance, accessibility and relatedness. *Ecol Lett*, 2014; 17: 1389-1399.
- Certain, G., Dormann, C.F., Planque, B.: Choices of abundance currency, community definition and diversity metric control the predictive power of macroecological models of biodiversity *Global Ecol Biogeogr*, 2014; 23 (4): 468-478.
- Dormann, C.F., Strauss, R.: A method for detecting modules in quantitative bipartite networks *Methods Ecol Evol*, 2014; 5 (1): 90-98.
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- Elfström, M., Zedrosser, A., Jerina, K., Støen, O.-G., Kindberg, J., Budic, L., Jonozović, M., Swenson, J. E.: Does despotic behavior or food search explain the occurrence of problem brown bears in Europe? *J Wildlife Manage*, 2014; 78: 881-893.
- Ensing, E.P., Ciuti, S., de Wijs, F.A.L.M., Lentferink, D.H., ten Hoedt, A., Boyce, M.S., Hut, R.A.: GPS based daily activity patterns in european red deer and north american elk ('*Cervus elaphus*'): Indication for a weak circadian clock in ungulates *Plos One*, 2014; 9 (9): e106997.
- Fassnacht, F., Hartig, F., Latific, H., Berger, C., Hernández, J., Corvalán, P., Koch, B.: Importance of sample size, data type and prediction method for remote sensing based estimations of aboveground forest biomass *Remote Sens Environ*, 2014; 154: 102-114.
- Gerstner, K., Dormann, C.F., Stein, A., Manceur, A.M., Seppelt, R.: Effects of land use on plant biodiversity - a global meta-analysis. *J Appl Ecol*, 2014; 51: 1690-1700.
- Gerstner, K., Dormann, C.F., Václavík, T., Kreft, H., Seppelt, R.: Accounting for geographic variation in species-area relationships improves the prediction of plant species richness at the global scale. *J Biogeogr*, 2014; 41: 261-273.
- Hartig, F., Dislich, C., Wiegand, T., Huth, A.: Technical Note: Approximate bayesian parameterization of a process-based tropical forest model *Biogeosciences*, 2014; 11: 1261-1272.
- Hartig, F., Dormann, C.F.: Does “model-free” forecasting really outperform the “true” model? *PNAS*, 2014; 110 (E397).
- Hartig, F., Münkemüller, T., Johst, K., Dieckmann, U.: On the sympatric evolution and evolutionary stability of coexistence by relative nonlinearity of competition *Plos One*, 2014; 9 (9): e94454.
- Haynes, K.J., Allstadt, A.J., Klimetzek, D.: Forest defoliator outbreaks under climate change: effects on the frequency and severity of outbreaks of five pine insect pests *Global Change Biol*, 2014; 20 (online): 2004-2018.
- Hudson, L. N., Newbold, T., Contu, S., Hill, S. L. L., Lysenko, I., De Palma, A., Phillips, H. R. P., Senior, R. A., Bennett, D. J., Booth, H., Choimes, A., Correia, D. L. P., Day, J., Echeverría-Londoño, S., Garon, M., Harrison, M. L. K., Ingram, D. J., Jung, M., Kemp, V., Kirkpatrick, L., Martin, C. D., Pan, Y., White, H. J., Aben, J., Abrahamczyk, S., Adum, G. B., Aguilar-Barquero, V., Aizen, M. A., Ancrenaz, M., Arbeláez-Cortés, E., Armbrecht, I., Azhar, B., Azpiroz, A. B., Baeten, L., Báldi, A., Banks, J. E., Barlow, J., Batáry, P., Bates, A. J., Bayne, E. M., Beja, P., Berg, Å., Berry, N. J., Bicknell, J. E., Bihm, J. H., Böhning-Gaese, K., Boekhout, T., Boutin, C., Bouyer, J., Bearley, F. Q., Brito, I., Brunet, J., Buczkowski, G., Buscardo, E., Cabra-García, J., Calviño-Cancela, M., Cameron, S. A., Canello, E. M., Carrijo, T. F., Carvalho, A. L., Castro, H., Castro-Luna, A. A., Cerdá, R., Cerezo, A., Chauvat, M., Clarke, F. M., Cleary, D. F. R., Connop, S. P., D'Aniello, B., da Silva, P. G., Darvill, B., Dauber, J., Dejean, A., Diekötter, T.,

Dominguez-Haydar, Y., Dormann, C.F., Dumont, B., Dures, S. G., Dynesius, M., Edenius, L., Elek, Z., Entling, M. H., Farwig, N., Fayle, T. M., Felicioli, A., Felton, A. M., Ficetola, G. F., Filgueiras, B. K. C., Fonte, S. J., Fraser, L. H., Fukuda, D., Furlani, D., Ganzhorn, J. U., Garden, J. G., Gheler-Costa, C., Giordani, P., Giordano, S., Gottschalk, M. S., Goulson, D., Gove, A. D., Grogan, J., Hanley, M. E., Hanson, T., Hashim, N. R., Hawes, J. E., Hébert, C., Helden, A. J., Henden, J.-A., Hernández, L., Herzog, F., Higuera-Diaz, D., Hilje, B., Horgan, F. G., Horváth, R., Hylander, K., Isaacs-Cubides, P., Ishitani, M., Jacobs, C. T., Jaramillo, V. J., Jauker, B., Jonsell, M., Jung, T. S., Kapoor, V., Kati, V., Katovai, E., Kessler, M., Knop, E., Kolb, A., Körösi, Á., Lachat, T., Lantschner, V., Le Féon, V., LeBuhn, G., Légaré, J.-P., Letcher, S. G., Littlewood, N. A., López-Quintero, C. A., Louhaichi, M., Lövei, G. L., Lucas-Borja, M. E., Luja, V. H., Maeto, K., Magura, T., Mallari, N. A., Marin-Spiotta, E., Marshall, E. J. P., Martínez, E., Mayfield, M.M., Mikusinski, G., Milder, J. C., Miller, J. R., Morales, C. L., Muchane, M. N., Muchane, M., Naidoo, R., Nakamura, A., Naoe, S., Nates-Parra, G., Navarrete Gutierrez, D. A., Neuschulz, E. L., Noreika, N., Norfolk, O., Noriega, J. A., Nöske, N. M., O'Dea, N., Oduro, W., Ofori-Boateng, C., Oke, C. O., Osgathorpe, L. M., Paritsis, J., Parra-H, A., Pelegrin, N., Peres, C. A., Persson, A. S., Petanidou, T., Phalan, B., Philips, T. K., Poveda, K., Power, E. F., Presley, S. J., Proença, V., Quaranta, M., Quintero, C., Redpath-Downing, N. A., Reid, J. L., Reis, Y. T., Ribeiro, D. B., Richardson, B. A., Richardson, M. J., Robles, C. A., Römbke, J., Romero-Duque, L. P., Rosselli, L., Rossiter, S. J., Roulston, T. H., Rousseau, L., Sadler, J. P., Sáfián, S., Saldaña-Vázquez, R. A., Samnegård, U., Schüepp, C., Schweiger, O., Sedlock, J. L., Shahabuddin, G., Sheil, D., Silva, F. A. B., Slade, E. M., Smith-Pardo, A. H., Sodhi, N. S., Somarriba, E. J., Sosa, R. A., Stout, J. C., Struebig, M. J., Sung, Y.-H., Threlfall, C. G., Tonietto, R., Tóthmérész, B., Tscharntke, T., Turner, E. C., Tylianakis, J. M., Vanbergen, A. J., Vassilev, K., Verboven, H. A. F., Vergara, C. H., Vergara, P. M., Verhulst, J., Walker, T. R., Wang, Y., Watling, J. I., Wells, K., Williams, C. D., Willig, M. R., Woinarski, J. C. Z., Wolf, J. H. D., Woodcock, B. A., Yu, D. W., Zaitsev, A. S., Collen, B., Ewers, R. M., Mace, G. M., Purves, D. W., Scharlemann, J. P. W., Purvis, A.: The PREDICTS database: a global database of how local terrestrial biodiversity responds to human impacts *Ecol Evol*, 2014; 4 (24): 2045-7758.

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- Thurfjell, H., Ciuti, S., Boyce, M.S.: Applications of step-selection functions in ecology and conservation *Movement Ecology*, 2014; 2: 4.
- van Teeffelen, J.A., Opdamb, P., Wätzold, F., Hartig, F., Johste, K., Drechsler, M., Vos, C.C., Wissel, S., Quétier, F.: Ecological and economic conditions and associated institutional challenges for conservation banking in dynamic landscapes *Landscape and Urban Planning*, 2014; 130: 64-72.

Buchbeiträge

- Everaars, J., Dormann, C.F.: Simulation of solitary (non-*Apis*) bees competing for pollen In: In *Silico Bees* (ed J. Devillers) Boca Raton, FL, USA.: CRC Press, 2014; 209-268.

Konferenzbeiträge

- Berberich, G., Grumpe, A., Berberich, M., Klimetzek, D., Wöhler, C.: Statistical correlation of ant mounds ('Formica spp.') and gas-permeable fault structures in the West Eifel and the Freiburg-Bonndorfer-Grabenzone. 2014 (Xth European Congress of Entomology, York, UK).
- Berberich, G., Sattler, T., Klimetzek, D., Benk, S., Schöler, H.F., Atlas, E.: Organohalogens in nest gas of a *Formica rufa* supercolony. 2014 (Xth European Congress of Entomology, York, UK).
- Klimetzek, D., Dormann, C.F.: Distribution and persistence of red wood ant nests: A geostatistical approach to 45 years of settlement. 2014 (Xth European Congress of Entomology, York, UK).

Rezensionen

- Dormann, C.F.: Book review: Mutualistic Networks, J. Bascompte, P. Jordano. Princeton University Press, Princeton Basic Appl Ecol, 2014; 15: 370-371.

Abschlussarbeiten

Masterarbeiten:

- Benz, Robin: Understanding dispersal ecology of young male ungulates ('*Cervus elaphus*') to design large scale wildlife corridors. (Betreuer Dr. Simone Ciuti, Department of Biometry and Environmental System Analysis, Erstgutachter Prof. Dr. Carsten F. Dormann, Department of Biometry and Environmental System Analysis, Zweitgutachter Prof. Dr. Mark Boyce, Faculty of Science at University of Alberta, Edmonton, Canada), 2014. <https://www.biom.uni-freiburg.de/lehre/PastThese/masterthesis-robinbenz.pdf>
- Dron, Cameron: Intergenerational Sharing of Non-Renewable Resources: An Experimental Study Using Rawls's Veil of Ignorance (Erstgutachter Stefan Wolf, Professorship of Environmental Economics and Resource Management, Zweitgutachter Dr. Florian Hartig, Department of Biometry and Environmental System Analysis), 2014. <https://www.wipo.uni-freiburg.de/dateien/research/cen-papers/cen01-2015>
- Heither, Hannah: Hotspots of fear: Effects of wolves on tree recruitment in the Białowieża Primeval Forest (Betreuer Dr. Simone Ciuti, Department of Biometry and Environmental System Analysis, Zweitgutachter Prof. Dr. A. Reif, Goethe University Frankfurt), 2014. <https://www.biom.uni-freiburg.de/lehre/PastThese/thesis-heither-2014.pdf>

Bachelorarbeiten:

- Hauenstein, Severin: Generalised Degrees of Freedom versus Cross-Validation as Measure of Model Complexity (Erstgutachter Prof. Dr. Carsten F. Dormann, Department of Biometry and Environmental System Analysis, Zweitgutachter Prof. Dr. Simon N. Wood, University of Bath), 2014. <https://www.biom.uni-freiburg.de/lehre/themen-fuer-abschlussarbeiten/gdfvscv.pdf>
- Lessmann, Antje: Positive und negative Dichteabhängigkeit als Mechanismen zur Erhaltung der biologischen Vielfalt (Betreuer Dr. Gita Benadi, Department of Biometry and Environmental System Analysis, Erstgutachter Prof. Dr. Carsten F. Dormann, Department of Biometry and Environmental System Analysis, Zweitgutachter Prof. Alexandra-Maria Klein, Chair of Nature Conservation and Landscape Ecology), 2014. <https://www.biom.uni-freiburg.de/lehre/themen-fuer-abschlussarbeiten/antje-lessmann-ba.pdf>
- Schendekehhl, Anäis Lou-Salomé: Grazing rates of common copepod species on ambient prey in the Gullmar Fjord, Sweden (Betreuer Prof. Dr. Peter Tisellius, University of Gothenburg, Erstgutachter Prof. Dr. Carsten F. Dormann, Department of Biometry and Environmental System Analysis, Zweitgutachter Prof. Dr. Christoph Külls, Fachhochschule Lübeck), 2014.
- Schmidt, Lennart: Modelling Population Dynamics of North Dakota Mule Deer (Betreuer Dr. Gita Benadi, Department of Biometry and Environmental System Analysis, Erstgutachter Prof. Dr. Carsten F. Dormann, Department of Biometry and Environmental System Analysis), 2014. <https://www.biom.uni-freiburg.de/lehre/themen-fuer-abschlussarbeiten/bachelorarbeit-lennart-schmidt-3317015-finale-version.pdf>
- Stramm, Friederike: Monitoring eco-touristic activities: Turtle-watching boat trips in the National Marine Park of Zakynthos, Greece (Betreuer Isabel Cristina Avila, Department of Biometry and

Environmental System Analysis, Erstgutachter Prof. Dr. Carsten F. Dormann, Department of Biometry and Environmental System Analysis, Zweitgutachter Prof. Dr. Gernot Segelbacher, Chair of Wildlife Ecology and Management), 2014. <https://www.biom.uni-freiburg.de/lehre/themen-fuer-abschlussarbeiten/stramm-2014-monitoring-eco-touristic-activities-turtle-watching-boat-trips-in-the-national-marine-park-of-zakynthos-greece.pdf>

- Vecera, Laura-Marie: Exploring the ecological and evolutionary drivers of diversification of the alpine plant genus *Phyteuma* (Campanulaceae) (Erstgutachter Prof. Dr. Carsten F. Dormann, Department of Biometry and Environmental System Analysis, Zweitgutachter Dr. Cristina Roquet Ruiz, Laboratoire d'Écologie Alpine), 2014. <https://www.biom.uni-freiburg.de/lehre/PastThese/bachelorthesis-lauravecera2.pdf>

Gastwissenschaftler

- Dr. Belarmain Fandohan, Republic of Benin, Houègbo, 01.09.2014 bis 01.09.2015
- Mathurin Kandem, Democratic Republic of the Congo, 01.11.2013 bis 01.07.2014
- Prof. Dr. Simon Wood, University of Bath, UK, 01.10.2013 bis 01.02.2014