

Blas M. Benito, PhD

Academic CV

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Summary

Education: PhD in Computational Ecology; MS in Geographical Information Systems; MS in Environmental Auditing; Postgraduate Certificate in Education; BSc in Biology.

Professional career: 15 years, 4 of PhD, 11 as postdoctoral researcher in Spain (University of Granada), Denmark (Aarhus University), Norway (University of Bergen), and Spain (University of Alicante). Has participated in 21 research projects.

Research topics: computational ecology, spatial modeling and simulation, applications of machine learning to spatial ecology, biogeography and palaeoecology.

[Google Scholar profile](#)

Published papers: 46

Citations (Google Scholar): 1639

H-index (Google Scholar): 20

Languages: Spanish (native), English (proficient).

Teaching qualification: Postgraduate Certificate in Education.

Teaching experience: 238 hours teaching at University (BSc and MS); 297 hours teaching spacialization courses.

Technical skills: data scientist highly proficient with the R language, frequensist and bayesian statistics, machine learning methods, agent-based models (Netlogo), geographical information systems, database development and management.

Personal skills: critical and independent thinking, creative approach to problem solving, highly communicative, values kindness, honesty, and fairness above everything else.

Education

University

2006 - 2009 **Ph.D. in Plant Ecology and Global Change**, *Department of Botany, University of Granada, Spain.*

2007 - 2009 **UNIGIS International Masters Degree in Geographical Information Systems**, *University of Girona, Spain.*

- 2007 - 2008 **Diploma of Advanced Studies (equivalent to a Master Degree in Environmental Biology)**, *University of Granada, Spain.*
- 2004 - 2006 **Masters Degree in Management and Environmental Auditing**, *University of Cadiz, Spain.*
- 1999 - 2003 **Degree in Biology**, *University of Granada, Spain.*

Specialization courses

- 2017 **Advances in Spatial Analysis of Multivariate Ecological Data: Theory and Practice**, PR Statistics, Margam Discovery Centre (Port Talbot, Wales), 20 hours.
- 2014 **Age-depth modelling with Clam and Bacon**, Queen's University (Belfast, Northern Ireland), 6 hours.
- 2012 **Ecological consequences of climate change: integrating research approaches**, Doñana Biological Station (Sevilla, Spain), 60 hours.
- 2011 **Introduction to the programming language Perl**, E-learning Centre, University of Granada (Granada, Spain), 30 hours.
- 2011 **Introduction to the programming language Python**, E-learning Centre, University of Granada (Granada, Spain), 30 hours.
- 2011 **Analysis of Ecological Data with R**, Andalusian Environmental Centre (CEAMA, Granada, Spain), 32 hours.
- 2007 **III Workshop in Ecological Niche Modeling**, GBIF-Spain (Madrid, Spain), 21 hours.
- 2006 **Geostatistic in Remote Sensing**, *National Congress in Geographic Information Technologies, (Granada, Spain), 8 hours.*
- 2005 **I Workshop in Ecological Niche Modeling**, GBIF-Spain (Madrid, Spain), 21 hours.

Research profile

Work positions

- 2022 - today **Data Scientist and Team Lead**, *Biome Makers Inc*, Description: Senior Data Scientist and Lead of the Environmental Data Team..
- 2020 - 2022 **Senior researcher**, *Maestre Lab, Department of Ecology & Multidisciplinary Institute for Environment Studies "Ramon Margalef" University of Alicante*, Description: senior researcher position funded by the EUROPEAN RESEARCH COUNCIL through the project BIODESERT (647038), lead by Prof. Fernando T. Maestre. In this position am analysing biogeographic patterns in global drylands..

- 2016 - 2019 **Postdoctoral fellowship**, *Ecological and Environmental Change Research Group, Department of Biological Sciences, University of Bergen, Norway*, Description: postdoctoral position funded by THE RESEARCH COUNCIL OF NORWAY through the project IGNEX (249894), lead by Prof. John H. Birks. In this position I perform quantitative analyses of long pollen records (up to 1.5MY) to elucidate the drivers of plant diversity change at millennial time scales..
- 2014 - 2016 **Postdoctoral fellowship**, *Section for Ecoinformatics and Biodiversity, Department of Bioscience, Aarhus University, Denmark*, Description: postdoctoral position funded by the AARHUS UNIVERSITETS FORKSNINGSFOND (AU Ideas), with Professors Jens-Christian Svenning, Brody Sandel, and Felix Riede as Principal Investigators. The main target of this position was to reach a better understanding of the factors limiting Neanderthal's distribution during warm periods, but I was also involved in other projects related with plant ecology and biogeography..
- 2012 - 2014 **Postdoctoral fellowship**, *Terrestrial Ecology Research Group, Department of Ecology, University of Granada, Spain*, Description: postdoctoral position funded by the Government of Andalusia. The grant was focused on the mechanistical modeling of plant range shift under climate change..
- 2010 - 2012 **Researcher**, *Andalusian Institute of Earth System Research, Granada, Spain*, Description: researcher position funded by the ENVIRONMENTAL COUNCIL OF THE GOVERNMENT OF ANDALUSIA, centered on the SIERRA NEVADA GLOBAL CHANGE OBSERVATORY. There I performed research activities related with the impacts of climate warming in the Sierra Nevada National Park..
- 2006 - 2010 **Predocctoral fellowship**, *Plant Conservation Unit, Department of Botany, University of Granada*, Description: Predocctoral position funded by the GOVERNMENT OF ANDALUSIA, and supervised by Professors Julio Peñas and Juan Lorite. This position was focused on plant conservation and Global Change..

Research projects

- 2020 - 2022 **Project BIODESERT: Biological feedbacks and ecosystem resilience under global change: a new perspective on dryland desertification** , *ERC project (647038)*, PI: Prof. Fernando T. Maestre.
- 2016 - 2019 **Project IGNEX: Interglacials and glacials - natural experiments in biodiversity dynamics**, *NFR-funded FRIMEDBIO project (249894)*, PI: Prof. H. John B. Birks.
- 2014 - 2016 **Centre for Biocultural History, work-package 3: Neanderthal Heritage**, *AU-Ideas, Aarhus University*, PI: Prof. Jens-Christian Svenning, Brody Sandel, Felix Riede.
- 2014 - 2016 **INQUA Project 1404: Cultural and palaeoenvironmental changes in Late Glacial to Middle Holocene Europe: gradual or sudden?**, *INQUA Commission for Humans and the Biosphere*, PI: Dr. Erick Robinson and Felix Riede.
- 2015 - 2017 **ALIENANT - Forecasting the establishment of alien species in a changing Antarctica: a biogeographical and local assessment of biotic homogenization risk**, *Government of Spain*, PI: Dr. Miguel Ángel Olalla.

- 2012 - 2014 **Global Change, altitudinal range shift and colonization of degraded habitats in mediterranean mountains (MIGRAME)**, *Government of Andalusia (reference code RNM-6734)*, PI: Dr. Regino Zamora.
- 2012 - 2016 **Paleobiogeography and conservation of *Abies pinsapo* Boiss and *Cedrus atlantica* (Endl.) Carrière: two species of relict flora from the Western Mediterraneo (RELIC-FLORA)**, *Government of Andalusia (reference code P11RNM-7033)*, PI: Dr. Francisca Alba.
- 2011 - 2014 **Phylogeography and conservation of endemic flora in island-like habitats: *Moehringia* sect. *Pseudomoehringia* iberian and north african species**, *I+D project, Government of Spain (reference code CGL2010-16357)*, PI: Dr. Julio Peñas.
- 2010 - 2011 **ALTAGUAX. Software development**, *UNESCO*, PI: Dr Regino Zamora.
- 2010 - 2011 **Plant distribution models for decision support in conservation planning**, *University of Granada - Government of Andalusia*, PI: Dr. Regino Zamora.
- 2010 - 2011 **Support to tasks of the Global Change Observatory of Sierra Nevada**, *University of Granada - Government of Andalusia*, PI: Dr Regino Zamora.
- 2010 - 2011 **Scientific coordination of research and monitoring tasks in the Sierra Nevada National Park**, *University of Granada - Government of Andalusia*, PI: Dr. Regino Zamora.
- 2010 - 2011 **Design of the Sierra Nevada Information System and integration in the REDIAM**, *University of Granada - Government of Andalusia*, PI: Dr. Regino Zamora.
- 2009 - 2012 **International Network of Forest Plots for Research and Conervation of the plant diversity in Central America**, *BBVA Foundation*, PI: Dr. Regino Zamora.
- 2009 - 2012 **Study of the ecological basis to the restoration of vegetation in the quarries of Venta de Huelma and Escúzar**, *KNAUFF*, PI: Dr. Juan Lorite.
- 2009 - 2010 **Atlas of Endangered Flora - IV (*Linaria nigricans*)**, *University of Granada - Ministry of Environment, Government of Spain*, PI: Dr. Julio Peñas.
- 2007 - 2008 **Design and creation of a repository of environmental models for de Andalusian Network of Environmental Information (REDIAM)**, *University of Granada - Government of Andalusia*, PI: Dr. Regino Zamora.
- 2007 - 2008 **A model to locate sensitive areas of protected species and habitat types of Community interest**, *University of Granada - Government of Andalusia*, PI: Dr. Regino Zamora.
- 2006 - 2010 **Conservation of endemic and endangered flora in fragile habitats: arid zones and high mountains of Andalusia (reference RNM 1067)**, *Government of Andalusia*, PI: Dr. Julio Peñas.

Publications in international peer-reviewed journals

- 2023 **Species Distribution Models predict abundance and its temporal variation in a steppe bird population**, *Monnier-Corbel, A., Robert, A., Hingrat, Y., Benito, B.M., Monnet, A-C.*, *GLOBAL ECOLOGY AND CONSERVATION* ([view at publisher](#)).

- 2022 **Environmental and human factors drive the subtropical marine forests of *Gongolaria abies-marina* to extinction**, *García, L.M., Rancel-Rodríguez, N.M., Sangil, C., Rejes, J., Benito, B.M., Orellana, S., Sansón, M.*, MARINE ENVIRONMENTAL RESEARCH ([view at publisher](#)).
- 2022 **Human practices behind the aquatic and terrestrial ecological decoupling to climate change in the tropical Andes**, *Benito, X., Benito, B.M., Vélez, M.I., Salgado, J., Schneider, T., Liviu, G., Nascimento, M.N.*, SCIENCE OF THE TOTAL ENVIRONMENT ([view at publisher](#)).
- 2022 **Density-dependence of reproductive success in a Houbara bustard population**, *Monnier-Corbel, A., Monnet, A.-C., Bacon, L., Benito, B.M., Robert, A., Hingrat, Y.*, GLOBAL ECOLOGY AND CONSERVATION ([view at publisher](#)).
- 2022 **Fourteen years of continuous soil moisture records from plant and biocrust-dominated microsites**, *Moreno, J., Asension, S., Berdugo, M., Gozalo, B., Ochoa, V., Pescador, D.S., Benito, B.M., Maestre, F.T.*, SCIENTIFIC DATA ([view at publisher](#)).
- 2021 **Biogeography of Global Drylands**, *F.T. Maestre, ..., Benito, B.M., ...*, NEW PHYTOLOGIST ([view at publisher](#)).
- 2021 **Ecological diversity within the rear-edge: a case study from Mediterranean *Quercus pyrenaica* Willd**, *Pérez-Luque, A., Benito, B.M., Bonet-García, F.J., Zamora, R.*, FORESTS ([view at publisher](#)).
- 2021 **Explainable artificial intelligence enhances the ecological interpretability of black-box species distribution models**, *Ryo, M., Angelov, B., Mammola, S., Kass, J.M., Benito, B.M., Hartig, F.*, ECOGRAPHY ([view at publisher](#)).
- 2020 **Comment on “A global-scale ecological niche model to predict SARS-CoV-2 coronavirus infection rate”**, author *Coro, Contina, A., Yanco, S.W., Pierce, A.K., DePrenger-Levin, M., Wunder, M.B., Neophytou, A.M., Lostroh, C.P., Telford, R.J., Benito, B.M., Chipperfiel, J.D. O’Hara, R.B., Carlson, C.J.*, ECOLOGICAL MODELLING ([view at publisher](#)).
- 2020 **Don’t gamble the COVID-19 response on ecological hypotheses**, *Carlson, C.J., Chipperfiel, J.D., Benito, B.M., Telford, R.J., O’Hara, R.B.*, NATURE ECOLOGY AND EVOLUTION ([view at publisher](#)).
- 2020 **Evaluating fossil charcoal representation in small peat bogs: Detailed Holocene fire records from southern Sweden**, *Cui, Q.-Y., Gaillard M.-J., Vannièrè, B., Colombaroli, D., Lemdahl, G., Olsson, F., Benito, B.M., Zhao, Y.*, THE HOLOCENE ([view at publisher](#)).
- 2020 **Late-spring frost risk between 1959 and 2017 decreased in North America but increased in Europe and Asia**, *Zohner, C.M., Mo, L., Renner, S.S., Svenning, J.-C., Vitasse, Y., Benito, B.M., et al*, PNAS ([view at publisher](#)).
- 2020 **Species distribution models are inappropriate for COVID-19**, *Carlson, C.J., Chipperfiel, J.D., Benito, B.M., Telford, R.J., O’Hara, R.B.*, NATURE ECOLOGY AND EVOLUTION ([view at publisher](#)).

- 2020 **[preprint] On the inadequacy of species distribution models for modelling the spread of SARS-CoV-1: response to Araújo and Naimi**, *Chipperfiel, J.D., Benito, B.M., O'Hara, R.B., Telford, R.J., Carlson, C.J.*, ECOEVORXIV ([view at publisher](#)).
- 2020 **distantia: an open-source toolset to quantify dissimilarity between multivariate ecological time-series.**, *Benito, B.M., H.J.B. Birks*, ECOGRAPHY ([view at publisher](#)).
- 2020 **Ecological memory at millennial time-scales: the importance of data constraints, species longevity, and niche features**, *Benito, B.M., Gil-Romera, G., H.J.B. Birks*, ECOGRAPHY ([view at publisher](#), [download supplementary material](#)). Published in the "Editor's Picks" section of the journal. Received [an award for the high number of downloads during the 12 months after publication...](#)
- 2020 **Holocene fire-vegetation dynamics in the Central Pyrenees (Spain)**, *Leunda, M., Gil-Romera, G., Adolf, C., Benito, B.M., Daniau, A-L., González-Sampériz, P.*, CATENA ([view at publisher](#)).
- 2019 **Long-term fire resilience of the Ericaceous Belt, Bale Mountains, Ethiopia**, *Gil-Romera, G., Adolf, C., Benito, B.M., et al.*, BIOLOGY LETTERS ([view at publisher](#), [download supplementary material](#)).
- 2019 **A multi-dating approach to age-modelling long continental records: the 135 ka El Cañizar de Villarquemado sequence (NE Spain)**, *Valero-Garces, B.L., González-Sampériz, P., Gil-Romera, G., Benito, B.M., et al.*, QUATERNARY GEOCHRONOLOGY ([view at publisher](#)).
- 2019 **Compositional turnover and variation in Eemian pollen sequences in Europe**, *Felde, V.A., Flantua, S.G.A., Jenks, C.R., Benito, B.M., et al.*, VEGETATION HISTORY AND ARCHAEOBOTANY ([view at publisher](#)).
- 2018 **Potential changes in the distribution of *Carnegiea gigantea* under future scenarios.**, *Albuquerque, F., Benito, B.M., Macias-Rodriguez, M.A., Gray, C.*, PEERJ ([view at publisher](#)).
- 2018 **Past and potential future population dynamics of three grouse species using ecological and whole genome coalescent modeling**, *Kozma, R., Lillie, M., Benito, B.M., Svenning, J-C., Höglund, J.*, ECOLOGY AND EVOLUTION ([view at publisher](#)).
- 2017 **Historical anthropogenic footprints in the distribution of threatened plants in China**, *Feng, G., Mao, L., Benito, B.M., Swenson, N.G., Svenning, J.C.*, BIOLOGICAL CONSERVATION ([view at publisher](#)).
- 2017 **Phylogenetic age differences in tree assemblages across the Northern Hemisphere increase with long-term climate stability in unstable regions**, *Feng, G., Ma, Z., Benito, B.M., Normand, S., Ordoñez, A., Jin, Y., Mao, L., Svenning, J-C.*, GLOBAL ECOLOGY AND BIOGEOGRAPHY ([view at publisher](#)).
- 2017 **Spring predictability explains different leaf-out strategies in the woody floras of North America, Europe and East Asia**, *Zohner, C., Benito, B.M., Fridley, J.D., Svenning, J.C., Renner, S.*, ECOLOGY LETTERS ([view at publisher](#)).

- 2017 **Investigating Neanderthal dispersal above 55N in Europe during Marine Isotope Stage 5**, Kellberg-Nielsen, T., **Benito, B.M.**, Svenning, J.C., Sandel, B., McKerracher, L., Riede, F., Kjaergaard, P.C., QUATERNARY INTERNATIONAL ([view at publisher](#)).
- 2017 **The ecological niche and distribution of Neanderthals during the Last Interglacial**, **Benito, B.M.**, Svenning, J.C., Kellberg-Nielsen, T., Riede, F., Gil-Romera, G., Mailund, T., Kjaergaard, P.C., Sandel, B., JOURNAL OF BIOGEOGRAPHY ([view at publisher](#)), among [top 20 most downloaded papers in the journal](#), highlighted in the Editor's Picks of [SCIENCE](#).
- 2016 **Day length unlikely to constrain climate-driven shifts in leaf-out times of northern woody plants**, Zohner, C.M., **Benito, B.M.**, Svenning, J.C., Renner, S.S., NATURE CLIMATE CHANGE ([view at publisher](#)).
- 2015 **A 2.5-million-year perspective on coarse-filter strategies for conserving nature's stage**, Gill, J.L., Blois, J.L., **Benito, B.M.**, Dobrowski, S., Hunter, M.L., McGuire, J.L., CONSERVATION BIOLOGY ([view at publisher](#)).
- 2015 **Extreme habitat loss in a Mediterranean habitat: *Maytenus senegalensis* subsp. *europaea***, Mendoza-Fernández, A.J., Martínez-Hernández, F., Pérez-García, F.J., Garrido-Becerra, J.A., **Benito, B.M.**, Salmerón-Sánchez, E., Guirado, J., Merlo, M.E., Mota, J.F., PLANT BIOSYSTEMS ([view at publisher](#)).
- 2014 **Supporting underrepresented forests in Mesoamerica**, de Albuquerque, F.S., **Benito, B.M.**, Beier, P., Assunção-Albuquerque, M.J., Cayuela, L., NATUREZA & CONSERVAÇÃO (BRAZILIAN JOURNAL FOR NATURE CONSERVATION) ([view at publisher](#)).
- 2014 **Model repositories in ecology: a conceptual framework and real implementation in a Global Change Monitoring Program**, Bonet, F.J., Pérez-Pérez, R., **Benito, B.M.**, Albuquerque, F., Zamora, R., ENVIRONMENTAL MODELLING & SOFTWARE ([view at publisher](#)).
- 2014 **Distribution and conservation of the relict interaction between the butterfly *Agriades zullichi* and its larval foodplant (*Androsace vitaliana nevadensis*)**, Barea-Azcón, J.M., **Benito, B.M.**, Olivares, J.O., Ruiz, H., Martín, J., García, A.L., López, R., BIODIVERSITY & CONSERVATION ([view at publisher](#)).
- 2014 **Forecasting plant range collapse in a Mediterranean hotspot: when dispersal uncertainties matter**, **Benito, B.M.**, Lorite, J., Pérez-Pérez, R., Gómez-Aparicio, L., Peñas, J., DIVERSITY AND DISTRIBUTIONS ([view at publisher](#)).
- 2013 **The impact of modeling choices in the predictive performance of richness maps derived from species-distribution models: guidelines to build better diversity models**, **Benito, B.M.**, Cayuela, L., Albuquerque, F.S., METHODS IN ECOLOGY AND EVOLUTION ([view at publisher](#)).
- 2013 **European Bird diversity is "well" represented by Special Protected Areas: mission accomplished?**, Albuquerque, F.S., Assunção-Albuquerque, M.J.T., Zamora, R., **Benito, B.M.**, Cayuela, L., BIOLOGICAL CONSERVATION ([view at publisher](#)).

- 2013 **Comparing the performance of species distribution models of *Zostera marina*: implications for conservation**, Valle, M., van Katwijk, M.M., de Jong, D.J., Bouma, T.J., Schipper, A.M., Chust, G., **Benito, B.M.**, Garmendia, J.M., Borja, A., JOURNAL OF SEA RESEARCH ([view at publisher](#)).
- 2013 **Interdisciplinary climate change collaborations are essential for early-career scientists**, Gornish, E., Hamilton, J., Barberán, A., **Benito, B.M.**, Binzer, A., DeMeester, J., Gruwez, R., Moreira, B., Taheri, S., Tomiolo, S., Vinagre, V., Vuarin, P., Weaver, J., EOS, TRANSACTIONS AMERICAN GEOPHYSICAL UNION ([view at publisher](#)).
- 2012 **ModelER: an environmental model repository as Knowledge base for Experts**, Pérez-Pérez, R., **Benito, B.M.**, Bonet, F.J., EXPERT SYSTEMS WITH APPLICATIONS ([view at publisher](#)).
- 2011 **Habitat fragmentation in arid zones: a case study of *Linaria nigricans* under land use changes (SE Spain)**, Peñas, J., **Benito, B.M.**, Lorite, J., Ballesteros, M., Cañadas, E.M., Martínez-Ortega, M., ENVIRONMENTAL MANAGEMENT ([view at publisher](#)).
- 2011 **Simulating potential effects of climate warming on altitudinal patterns of key species in mediterranean-alpine ecosystems**, **Benito, B.M.**, Lorite, J., Peñas, CLIMATIC CHANGE ([view at publisher](#)).
- 2010 **Past and present potential distribution of the iberian *Abies* species: a phytogeographic approach using fossil pollen data and niche-based models**, Alba-Sánchez, F., López-Sáez, J.A., **Benito, B.M.**, Linares, J.C., Nieto-Lugilde, D., López-Merino, L., DIVERSITY AND DISTRIBUTIONS ([view at publisher](#)).
- 2010 **First record for *Polygala balansae* Cosson in Europe**, Lorite, J., Peñas, J., **Benito, B.M.**, Cañadas, E., Valle, F., ANNALES BOTANICI FENNICI ([view at publisher](#)).
- 2009 **Assessing extinction-risk of endangered plants using species distribution models: a case study of habitat depletion caused by the spread of greenhouses**, **Benito, B.M.**, Martínez-Ortega, M.M., Muñoz, L.M., Lorite, J., Peñas, J., BIODIVERSITY AND CONSERVATION ([view at publisher](#)).
- 2008 ***Astragalus peregrinus* subsp. *warionis* and *A. gutattus* (fabaceae): new for the Iberian peninsula**, Peñas, J., **Benito, B.M.**, Lorite, J., Concepción Morales, M., Martínez-Ortega, M.M., PHYTON ([view at publisher](#)).

Publications in Spanish peer-reviewed journals

- 2014 **[translated title] Documenting models and workflows: the next challenge in the management of ecological information**, F.J., Bonet-García, R., Pérez-Pérez, **Benito, B.M.**, A.J. Pérez-Luque, R.J., Zamora, ECOSISTEMAS ([view at publisher](#)).
- 2012 **Modelling spatial and temporal variability of intertidal *Zostera Marina* on the Ems estuary, Dutch Wadden Sea**, Valle, M., **Benito, B.M.**, van Katwijk, M., de Jong, D., Borja, A., Chust, G., REVISTA DE INVESTIGACIÓN MARINA ([view at publisher](#)).

- 2012 **[translated title] The International Network of Forest Inventory Plots (BIOTREE-NET) in Mesoamerica: advances, challenges and future perspectives**, *Cayuela, L., ... Benito, B.M., ...*, ECOSISTEMAS ([view at publisher](#)).
- 2009 **[translated title] Palaeopalynological history and suitability model of *Abies alba* in the Pyrenees mountain range**, *Sánchez, F.A., Sáez, J.A.L., Benito, B.M., Merino, L.L.*, PIRINEOS ([view at publisher](#)).
- 2007 **[translated title] Species distribution models applied to biodiversity conservation in the southeastern Iberian peninsula**, *Benito, B.M., Peñas, J.*, GEOFOCUS ([view at publisher](#)).
- 2007 **[translated title] Novel records of endangered plants in the arid plains of Granada (Basin of Guadix and Baza)**, *Gutiérrez, L., Del Río, J., Navarro, F.B., Lorite, J., Benito, B.M., Peñas, J.*, LAGASCALIA ([view at publisher](#)).

Book chapters

- 2022 ***Altitudinal patterns and changes in the composition of high mountain plant communities***, Lorite, J., Lamprecht, A., Peñas, J., Rondinel-Mendoza, K., Fernandez-Calzado, R., **Benito, B.M.**, Cañadas, E., in: THE LANDSCAPE OF THE SIERRA NEVADA: A UNIQUE LABORATORY OF GLOBAL PROCESSES IN SPAIN, pages 171-191, SPRINGER INTERNATIONAL PUBLISHING ([view at publisher](#)).
- 2012 ***Species distribution models and range shift***, **Benito, B.M.**, in: GLOBAL CHANGE OBSERVATORY OF SIERRA NEVADA: MONITORING METHODS (Eds. Aspizua, R., Barea-Azcón, J.M., Bonet, F.J., Pérez-Luque, A.J., Zamora, R.), pages 96-97, CONSEJERÍA DE MEDIO AMBIENTE, JUNTA DE ANDALUCÍA ([download pdf](#)).
- 2012 ***Future climatic simulations***, **Benito, B.M.**, Pérez, R., Reyes, P., in: GLOBAL CHANGE OBSERVATORY OF SIERRA NEVADA: MONITORING METHODS (Eds. Aspizua, R., Barea-Azcón, J.M., Bonet, F.J., Pérez-Luque, A.J., Zamora, R.), pages 28-31, CONSEJERÍA DE MEDIO AMBIENTE, JUNTA DE ANDALUCÍA ([download pdf](#)).
- 2011 ***Ononis tridentata subsp. crassifolia (Dufour ex Boiss.) Nyman***, Ballesteros, M., Cañadas, E., **Benito, B.M.**, Peñas, J., Lorite, J., in: PLANT DIVERSITY OF THE IBERIAN GYPSUM SOILS. THE CHALLENGES OF THE EDAPHIC ISLANDS FOR CONSERVATION BIOLOGY (Eds. Mota, J.F., Sánchez, P., Guirado, J.S.), pages 161-162, ADIF and Mediterráneo Asesores-Consultores.
- 2011 ***Astragalus oxyglottis M. Bieb.***, Peñas, J., Salazar, C., Gutiérrez, L., Del Río, J., **Benito, B.M.**, Navarro, F.B., Lorite, J., in: PLANT DIVERSITY OF THE IBERIAN GYPSUM SOILS. THE CHALLENGES OF THE EDAPHIC ISLANDS FOR CONSERVATION BIOLOGY (Eds. Mota, J.F., Sánchez, P., Guirado, J.S.), pages 121-122, ADIF y Mediterráneo Asesores-Consultores.
- 2011 ***Astragalus guttatus Bank & Sol***, Peñas, J., Del Río, J., **Benito, B.M.**, Martínez-Ortega, M.M., Lorite, J., in: PLANT DIVERSITY OF THE IBERIAN GYPSUM SOILS. THE CHALLENGES OF THE EDAPHIC ISLANDS FOR CONSERVATION BIOLOGY (Eds. Mota, J.F., Sánchez, P., Guirado, J.S.), pages 114-116, ADIF y Mediterráneo Asesores-Consultores.
- 2010 ***Linaria nigricans Lange***, Peñas, J., Ballesteros, M., **Benito, B.M.**, Cañadas, E., Lorite, J., in: ATLAS AND RED BOOK OF THE ENDANGERED VASCULAR FLORA OF SPAIN (Eds. Bañares, A., Blanca, G., Güemes, J., Moreno, J.C., Ortiz, S.), pages 80-81, National Office of the Environment and Forest Policy and the Spanish Society of Conservation Biology of Plants. Madrid.
- 2010 ***Sierra Nevada, soils and landscape***, **Benito, B.M.**, and others, in: FIELD GUIDE OF THE FOURTH IBERIAN CONGRESS OF SOIL SCIENCE, Copicentro Granada.
- 2008 ***Greenhouses, land use change, and predictive models: MaxEnt and Geomod working together***, **Benito, B.M.**, Peñas, J., in: MODELLING ENVIRONMENTAL DYNAMICS: ADVANCES IN GEOMATIC SOLUTIONS (Eds. Paegelow, M., Camacho-Olmedo, M.T.), chapter 11, pages 297 - 317, Springer ([view at publisher](#)).

Intellectual property

- 2008 **MODELER: A model repository as knowledge base for experts**, *Registration code 201299900779498, Expedient Number: GR-188-12*, This software allows the storage, management and execution of scientific workflows. It is currently on-line at the Global Change Observatory of Sierra Nevada (Spain), and provides an automated execution framework for the different environmental models available in the Observatory.

Published software

Personal GitHub repository: <https://github.com/BlasBenito>

- 2019 **memoria**, *R package available at CRAN and GitHub.*, Tools to quantify ecological memory in long time-series with Random Forest models (Breiman 2001) fitted with the 'ranger' library (Wright and Ziegler 2017). Particularly oriented to palaeoecological datasets and simulated pollen curves produced by the 'virtualPollen' package, but also applicable to other long time-series involving a set of environmental drivers and a biotic response..
- 2019 **virtualPollen**, *R package available at CRAN and GitHub.*, Tools to generate virtual environmental drivers with a given temporal autocorrelation, and to simulate pollen curves at annual resolution over millennial time-scales based on these drivers and virtual taxa with different life traits and niche features. It also provides the means to simulate quasi-realistic pollen-data conditions by applying simulated accumulation rates and given depth intervals between consecutive samples..
- 2019 **distantia**, *R package available at GitHub.*, Tools to assess the dissimilarity between multivariate time series by using the psi measure described in "Numerical methods in Quaternary pollen analysis" (Birks and Gordon, 1985). The algorithm computes a matrix of distances (euclidean, manhattan, chi) between all sample pairs, and minimizes the sum of distances, constrained by sample order..
- 2019 **palaeoFireModeling**, *Netlogo model available at GitHub.*, This is a spatio-temporal simulation of the effect of fire regimes on the population dynamics of five forest species (*Pinus sylvestris*, *Pinus uncinata*, *Betula pendula*, *Corylus avellana*, and *Quercus petraea*) during the Lateglacial-Holocene transition (15-7 cal Kyr BP) at El Portalet, a subalpine bog located in the central Pyrenees region (1802m asl, Spain)..
- 2019 **rangeShiftSimulation**, *Netlogo model available at GitHub.*, Mechanistical model simulating the range shift of *Quercus pyrenaica* in the Sierra Nevada National Park (Granada, Spain) under different climate warming scenarios. Range shift is modeled as an emergent property of the acorn-dispersal behavior of the Eurasian Jay, the changing climatic conditions in the tree line, and the topographic structure of the terrain..

Conference talks

- 2014 **Use of Bacon for cross-validation of age-depth models**, *Age Models, Chronologies, and Databases Workshop*, Belfast, Northern Ireland.

- 2013 **Ecology *in silico*: Dynamic Species Distribution Models**, *Plenary talk at the XV Autumn School of Mathematical Biology*, Hermosillo, Sonora, Mexico.
- 2013 **Pyrenean Oak range shift and colonization of degraded habitats mediated by the European Jay: dynamic simulation with Agent-Based Models**, *XI National Congress of the Spanish Association of Terrestrial Ecology*, Pamplona.

Conference talks (as co-author)

- 2016 **Historical climates explain contrasting dormancy-breaking requirements in North American, Asian, and European woody species**, *EGU General Assembly Conference*, Vienna, Austria.
- 2015 **Depth-age models of long continental sequences: a Bayesian approach in the 130 Ka Villarquemado sequence (NE Iberia)**, *INTIMATE: Integrating ice core, marine, and terrestrial records*, Zaragoza, Spain.
- 2013 **Biotic and abiotic features of *Quercus pyrenaica* Willd. populations in Sierra Nevada**, *XI National Congress of the Spanish Association of Terrestrial Ecology*, Pamplona, Spain.
- 2012 **Modelling the spatial and temporal variability of intertidal *Zostera marina* on the Ems estuary, Dutch Wadden Sea**, *XVII Simposio Ibérico de Estudios de Biología Marina*, Donostia-San Sebastián, Spain.
- 2011 **An Environmental Model Repository: case studies applied to Sierra Nevada LTER Site**, *European Ecological Federation Congress*, Ávila, Spain.
- 2010 **Looking back and looking ahead: Biogeographical history of *Abies* sp. under different climate change scenarios**, *II Iberian Seminar IGBP - Global Change in the Iberian peninsula: an integrated perspective*, Lisbon, Portugal.
- 2009 **Potential distribution of the Iberian *Abies* species: a phytogeographic approach based on pollen records and species distribution models**, *IX Congress of the Spanish Society of Terrestrial Ecology*, Úbeda, Spain.
- 2006 **Effects of habitat fragmentation and loss over the endemic plant *Linaria nigricans* (southern Iberian peninsula)**, *V International Symposium on Wild Flora of Arid Lands*, Hermosillo, Sonora (Mexico).
- 2006 **Predictive models applied to the conservation of endangered flora: greenhouses versus *Linaria nigricans* in the arid lands of southern Iberian peninsula**, *XXI National Congress on Geographic Information Technology*, Granada, Spain.

Posters in conferences and workshops

- 2015 **Reconstructing the geographic distribution and ecological niche of Neanderthals during Oxygen Isotope Stage 5e (~125 ka BP)**, *International Biogeography Society*, Bayreuth, Germany.
- 2015 **History of *Corylus avellana* L. in the Iberian Peninsula between 40 - 8 cal kyr BP: influence of climate events and postglacial spread**, *INTIMATE: Integrating ice core, marine, and terrestrial records*, Zaragoza, Spain.

- 2013 **To migrate, or not to migrate, that is the question: forecasting plant extinction under climate change in a Mediterranean hotspot with a stochastic dynamic species distribution models**, *Adapting to Climate Change in the Mediterranean Hotspot*, Sevilla, Spain.
- 2011 **Effects of Climate Change over the endangered plants of island-like habitats: the case of *Moehringia fontqueri* Pau**, *V Congress of Plant Conservation Biology*, Palma, Islas Baleares, Spain.
- 2009 **Biology of the Sierra Nevada endemic *Moehringia fontqueri* Pau**, *45th International Congress SISV and FIP*, Cagliari, Sardinia.
- 2009 **Effects of Climate Warming in the distribution of endangered plants of arid lands and high mountains**, *IV Congress of Plant Conservation*, Almeria, Spain.
- 2009 **The conservation of the rare *Succisella andreae-molinae***, *IV Congress of Plant Conservation Biology*, Almeria, Spain.
- 2009 **Evaluating the conservation status of *Ononis tridentata* subsp. *crassifolia***, *IV Congress of Plant Conservation Biology*, Almeria, Spain.
- 2007 **Species distribution models applied to the ecology and conservation of endangered plants**, *49th Annual Conference of the International Association for Vegetation Science*, Palmerston North, New Zealand.
- 2007 **Preliminary research on the conservation biology of *Krascheninnikovia ceratoides***, *III Congress of Plant Conservation Biology*, Puerto de la Cruz, Spain.
- 2007 **Genetic diversity applied to the conservation of endangered plants of the southern Iberian peninsula: *Linaria nigricans***, *III Congress of Plant Conservation Biology*, Puerto de la Cruz, Spain.
- 2007 **Species distribution models as tools to find new populations of endangered plant species**, *III Congress of Plant Conservation Biology*, Puerto de la Cruz, Spain.
- 2007 ***Astragalus warionis*, neophyte, or a new endangered species in the Iberian peninsula?**, *III Congress of Plant Conservation Biology*, Puerto de la Cruz, Spain.
- 2006 **Predictive distribution models as a tool for conservation: endangered plants in the arid southeastern Iberian Peninsula**, *1st European Congress of Conservation Biology*, Eger, Hungary.
- 2006 **Predictive models applied to the conservation of endangered plants: greenhouses versus *Linaria nigricans* in southeastern Spain**, *XII National Congress of Geographic Information Technology*, Granada, Spain.
- 2005 **Predictive models of endemic plant species distribution in the arid lands of SE Iberian Peninsula**, *Predictive Modelling of Species Distribution: New Tools for the XXI Century*, Baeza, Spain.
- 2005 **Plant diversity loss in arid ecosystems. The habitat of *Linaria nigricans* in SW Europe**, *48th IAVS Symposium*, Lisbon, Portugal.
- 2005 **Fragmentation analysis and spatial patterns of *Linaria nigricans*: implications for conservation**, *II Congress of Plant Conservation Biology*, Gijon, Spain.

Teaching

Training

- 2003 - 2004 **Postgraduate Certificate in Education (Certificado de Aptitud Pedagógica)**, University of Granada, Spain.
- 2003 - 2004 **Course: [translated title] Assessment in Educational Centres: from teaching practice to learning processes**, National Association of Education Professionals (Murcia, Spain), 185 hours.
- 2003 - 2004 **Course: [translated title] Processes, strategies, and organizational models to improve teaching in Environmental Education**, National Association of Education Professionals (Murcia, Spain), 185 hours.

Teaching experience at University (BsC and MS)

- 2014 - 2016 **Macroecology**, *Degree in Biology, Department of Bioscience, Aarhus University*, 4 hours.
- 2010 - 2014 **Ecoinformatics**, *University Master "Biodiversity Conservation, Management and Restoration", Department of Ecology, University of Granada, Spain*, 60 hours.
- 2012 - 2013 **Methods for the Study of the Natural Environment**, *Degree in Biology, Department of Ecology, University of Granada*, 13.4 hours.
- 2012 - 2013 **Applied Ecology**, *Degree in Biology, Department of Ecology, University of Granada*, 10.2 hours.
- 2012 - 2013 **Communities and Systems Ecology**, *Degree in Environmental Sciences, Department of Ecology, University of Granada, Spain*, 26.4 hours.
- 2012 - 2013 **Foundations of Applied Ecology I**, *Degree in Environmental Sciences, Department of Ecology, University of Granada, Spain*, 4 hours.
- 2009 - 2010 **Botany**, *Degree in Biology, Department of Botany, University of Granada, Spain*, 25 hours.
- 2009 - 2010 **Geographical Information Systems applied to Biodiversity Research and Conservation**, *Master in Biodiversity Research and Conservation, Spanish Agency for International Cooperation (AECI), University of Granada - Universidad Mayor de San Francisco Xavier de Chuquisaca (Sucre, Bolivia)*, 60 hours.
- 2001 - 2002 **Practicum in Animal Environmental Physiology**, *Degree in Biology, Department of Zoology, University of Granada*, 25 hours.
- 2001 - 2002 **Practicum in Animal Physiology**, *Degree in Biology, Department of Zoology, University of Granada*, 20 hours.

Teaching in Specialization Courses

- 2011 to 2019 **GBIF Workshop in Ecological Niche Modelling**, *GBIF Spain - National Research Council, Royal Botanical Garden, Madrid*, 23 hours per year (184 hours in total).

- 2017 **Practical Introduction to Species Distribution Modelling**, *Research School for Ecology, Biodiversity and the Environment, University of Stockholm, Sweden*, 20 hours.
- 2015 **Introduction to Species Distribution Modelling**, *Department of Botany, University of Salamanca, Spain*, 24 hours.
- 2013 **Practical introduction to Species Distribution Modelling**, *Spanish Association of Terrestrial Ecology*, 24 hours.
- 2013 **Introduction to Geographic Information Systems with open software tools: Quantum GIS and GRASS GIS**, *CSIC (Spanish National Research Council)*, 20 hours.
- 2011 **New Frontiers in the Species Distribution Models (with Dr. David Nogués-Bravo)**, *Andalusian Center of the Environment (CEAMA) - University of Granada*, 12 hours.
- 2010 to 2013 **Capture, management and analysis of geographic information, in the “Course of research methods in Environmental Biology”**, *Department of Ecology - University of Granada*, 2 hours.
- 2009 **Design and automated execution of scientific workflows with Kepler**, *Andalusian Center of the Environment (CEAMA) - University of Granada*, 3 hours.
- 2008 **Species Distribution Models applied to research in endangered flora**, *Spanish Society of Plant Conservation Biology, University of Valencia*, 8 hours.