



CV date	01/11/2021
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Parte A. PERSONAL INFORMATION

First and Family name	José M. Maroto		
Researcher codes	WoS Researcher ID (*)	ABB-5370-2021	
	SCOPUS Author ID(*)	36658578600	
	Open Researcher and Contributor ID (ORCID) **	0000-0001-6446-2755	

A.1. Current position

Name of University/Institution	Complutense University of Madrid (UCM)		
Department	Financial and Actuarial Economy and Statistics		
Address and Country	Economic and Business Administration Faculty. Campus of Somosaguas. 28223 Madrid. Spain		
	E-mail	maroto@ccee.ucm.es	
Current position	Associate Professor	From	01/09/2008
Key words	Sustainability, Scientific advice, Precautionary Approach, Reference points, Fisheries economics, Mathematical bioeconomics, Stochastic population dynamics, Dynamic optimization, Age-structured models, Transient dynamics		

A.2. Education

BSc/MSc/PhD	University	year
BSc in Economics	Carlos III University of Madrid	1990-1994
MSc in Economics and Business	Pompeu Fabra University of Barcelona	1995-1996
PhD Economics	Complutense University of Madrid	2004

Parte B. CV SUMMARY

There is an urgent social need to improve scientific advice for sustainable management of overexploited fish stocks, based on the precautionary approach, by providing scientifically sound reference points and management strategies, strengthening resilience, and ensuring long-term sustainability. This is the challenge that my research aims to address. In particular, the aim of my research is to develop stochastic bioeconomic and population dynamics models which allow us to analyze the collapse, lack of recovery, and extinction of overexploited fish populations, providing management measures ensuring long-term sustainability of these species. The main feature of my scientific trajectory is that it is both inter- and multidisciplinary. In this regard, I have been published general results in different research areas: Economics, Ecology, Environmental Studies and Applied Mathematics.



Since 2003, I have actively collaborated with the Norwegian School of Economics (NHH), by periodically visiting its leading Centre for Fisheries Economics (SNF). In 2005, I carried out a research stay at Southern Methodist University (SMU) (Dallas), invited by Santanu Roy, a leading researcher in Mathematical Economics.

Since 1999, I have been involved in 13 consecutive competitive research projects (6 national, 4 international and 3 UCM-Santander Bank).

I led an international coordinated competitive research project in 2014 on bioeconomic modeling, fish population dynamics, and data assimilation methods (DAM) within NILS Science and Sustainability Program, funded by EEA Grants.

Since 2014, I am member of the leading research Institute of Interdisciplinary Mathematics (IMI) at UCM.

Since 2015, I have organized 2 international seminars on bioeconomic modeling, fish population dynamics, and DAM, funded by EEA Grants, and UCM (Special Research Actions Program). Leading researchers, members of the European Academy of Sciences, the International Council for the Exploration of the Sea (ICES), Spanish Institute of Oceanography (IEO) (Vigo) and the Northwest Atlantic Fishery Organization (NAFO), were invited speakers in those seminars.

I have been invited to 19 national and international conferences, and attended 13 international congresses, and 1 national, of the main international associations of different research areas: AERNA, EAERE, IIFET, ISEE, SAEe y WFC.

I am a reviewer for relevant international journals of different research areas: Ecological Economics, Ecological Modelling, and ICES Journal of Marine Science.

Since 2018, I am Co-PI of the UCM-Research Group “Applied Mathematical Economics (ECOMAP)”.

At present, I head up 2 research projects on sustainable fisheries management where our research team (UCM, UAM, IEO and NAFO) and leading international researchers at NHH are involved.

Part C. RELEVANT MERITS

C.1. Publications

1. Sandal, L., Kvamsdal, S., Maroto, J.M., Morán, M., and Sandal, L., 2021. A contraction approach to dynamic optimization problems. *PLoS ONE* 16(11): e0260257. <https://doi.org/10.1371/journal.pone.0260257>.
2. Kvamsdal, S., Maroto, J.M., Morán, M., and Sandal, L., 2020. Bioeconomic modeling of seasonal fisheries. *European Journal of Operational Research* 281, 2, 332-340. doi.org/10.1016/j.ejor.2019.08.031.
3. Maroto, J.M., and Morán, M., 2019. Transient dynamics: Equilibrium, collapse, and extinction in age-structured models. The case of the Northern cod stock. *Ecological Modelling* 398, 35-43. DOI: 10.1016/j.ecolmodel.2019.02.006.
4. Kvamsdal, S., Maroto, J.M., Morán, M., and Sandal, L., 2017. A bridge between continuous and discrete-time bioeconomic models: Seasonality in fisheries. *Ecological Modelling* 364, 124-131. DOI: 10.1016/j.ecolmodel.2017.09.020.
5. Maroto, J.M., and Morán, M., 2014. Detecting the presence of depensation in collapsed fisheries: The case of the Northern cod stock. *Ecological Economics* 97, 101-109. DOI: 10.1016/j.ecolecon.2013.11.006.



6. Maroto, J.M., Morán, M., Sandal, L., and Steinshamn, S.I., 2012. Potential Collapse in Fisheries with Increasing Returns and Stock-dependent Costs. *Marine Resource Economics* 27, 43-63. DOI: 10.5950/0738-1360-27.1.43.
7. Maroto, J.M., 2009. Comment on the paper “The Evaluation of Fisheries Management: A Dynamic Stochastic Approach”, *Moneda y Crédito* 228, 139-144.
8. Maroto, J.M., and Morán, M., 2008. Increasing marginal returns and the danger of collapse of commercially valuable fish stocks. *Ecological Economics* 68, 422-428. DOI: 10.1016/j.ecolecon.2008.04.013.
9. Maroto, J.M., and Morán, M., 2007. Lipschitz continuous dynamic programming with discount II. *Nonlinear Analysis-Theory Methods & Applications* 67, 1999-2011. DOI: 0.1016/j.na.2006.08.027.
10. Maroto, J.M., and Morán, M., 2005. Lipschitz continuous dynamic programming with discount. *Nonlinear Analysis-Theory Methods & Applications* 62, 877-894. DOI: 10.1016/j.na.2005.03.100.

C.2. Other publications

1. Sandal, L., Kvamsdal, S., Maroto, J.M., and Morán, 2017. A contraction approach to periodic optimization problems. Centre for Applied Research (SNF) at Norwegian School of Economics (NHH). Working Paper No. 14/17. ISSN: 1503-2140. <https://openaccess.nhh.no/nhh-xmlui/handle/11250/2573862>
2. Kvamsdal, S., Maroto, J.M., Morán, M., and Sandal, L., 2016. A bellman approach to periodic optimization problems. Norwegian School of Economics (NHH), Dept. of Business and Management Science, Discussion paper 19, 2016. ISSN 1500-4066. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2877764
3. Kvamsdal, S., Maroto, J.M., Morán, M., and Sandal, L.K., 2015. Continuous vs. discrete-time bioeconomic models: Seasonal fisheries. Working Paper (eprint) 34774. Universidad Complutense de Madrid. <http://eprints.ucm.es/34774/>
4. Maroto, J.M., Morán, M., 2013. Modeling the stochastic dynamics of the aggregate stock in collapsed fisheries: The case of the Northern cod stock. Working paper (eprint) 23024. Universidad Complutense de Madrid. <http://eprints.ucm.es/23024/>
5. Maroto, J.M., Morán, M., 2012. Deterministic Population Dynamics of Fish Stocks at Low Population Sizes: A Parametric Spline Approach. Proceedings of the Sixteenth Biennial Conference of the International Institute of Fisheries Economics and Trade, July 16-20, Dar es Salaam, Tanzania. Edited by Ann L. Shriver. International Institute of Fisheries Economics and Trade (IIFET), Corvallis, 2012. <https://ir.library.oregonstate.edu/xmlui/handle/1957/34927>
6. Morán, M., and Maroto, J.M., 2012. Equilibrio vs. colapso de especies marinas comerciales en modelos estructurados por edades. Working paper (eprint) 14925. Universidad Complutense de Madrid. <http://eprints.ucm.es/14925/>
7. Maroto, J.M., Morán, M., Sandal, L., and Steinshamn, S.I., 2009. Continuous harvesting costs in sole-owner fisheries with increasing marginal returns. Norwegian School of Economics (NHH), Dept. of Business and Management Science, Discussion paper 6, ISSN: 1500-4066. <https://brage.bibsys.no/xmlui/bitstream/handle/11250/163977/1/dpfor2009-6.pdf>
8. Maroto, J.M., 2004. Programación dinámica Lipschitz continua: aplicación a la explotación óptima de recursos renovables. Libro de Actas del Congreso Nolineal 2004 – Nuevos retos y perspectivas en la dinámica no lineal y sus aplicaciones, ISBN: 84-688-7462-0, p. 55, Toledo (España), 2004.
9. Morán, M., and Maroto, J.M., 2001. Non-smooth dynamic optimization. Working paper. Departamento de Fundamentos del Análisis Económico I. Universidad Complutense de Madrid.



C.3. National and international research projects as Principal Investigator (PI), and funded research activities as PI

Title: Improving scientific advice for sustainable management of overexploited fish stocks: Transient dynamics and bioeconomic modeling of seasonal fisheries

Funding agency: Complutense University of Madrid (UCM)-Santander Bank. PR108/20-14

Participating institutions: UCM, UAM, Spanish Institute of Oceanography (IEO) (Vigo), the Northwest Atlantic Fishery Organization (NAFO), and Norwegian School of Economics (NHH).

Project period: 12/04/2021-11/04/2022

Funding: 12000€

PI: José María Maroto Fernández

Number of participants: 10

Title: Sustainable management of fisheries: Transient dynamics and limit reference points

Funding agency: UCM-Santander Bank. PR87/19-22582

Participating institutions: UCM, UAM, NHH, IEO (Vigo), and NAFO.

Project period: 13/12/2019-12/09/2021

Funding: 7900€

PI: José María Maroto Fernández

Number of participants: 10

Title: UCM grant for the UCM-Research Group “Applied Mathematical Economics (ECOMAP)”.

Funding agency: UCM (Ref.: 940038)

Project period: 2020-2021

Funding: 1000€

PI: José María Maroto Fernández, José Manuel Rey Simó

Number of participants: 10

Title: UCM grant for the UCM-Research Group “Applied Mathematical Economics (ECOMAP)”.

Funding agency: UCM (Ref.: 940038)

Project period: 2019-2020

Funding: 1000€

PI: José María Maroto Fernández, José Manuel Rey Simó

Number of participants: 10

Seminario Internacional: International Seminar on Age-Structured Population Dynamics Models.

Director (PI): José María Maroto Fernández

Funding agency: UCM (Special Research Actions Program) (AEC9/17-20712)

Funding: 1000€

Place: UCM, 02/11/2017.

Diptych:

<https://blogs.upm.es/dma/wp-content/uploads/sites/144/2017/11/D%C3%ADptico-15x21-seminario-ucm-2017.pdf>

Seminario Internacional: NILS Science and Sustainability International Seminar on Continuous vs. Discrete-Time Bioeconomic Models: Seasonal Fisheries.

Director (PI): José María Maroto Fernández, NILS Science and Sustainability. European Project (ES07 – EEA Grants) (021-ABEL-CM-2013)

Funding agency: NILS Science and Sustainability (ES07 – EEA Grants) (009-2BBRR)

Funding: 6000€

Place: UCM, 17/11/2015.

Diptyco: en la web ECOMAP

Title: Stochastic Bioeconomic and Population Dynamics Modeling of Collapsed Fisheries.

Funding agency: NILS Science and Sustainability. Proyecto europeo (ES07 – EEA Grants) (021-ABEL-CM-2013)

Participating institutions: UCM, UAM y Norwegian School of Economics (NHH)

Project period: 21/02/2014-21/10/2015

Funding: 65300€.

PI: José María Maroto Fernández



Number of participants: 9

C.4. Participation in national research projects

Title: Optimality in age-structured bioeconomic models

Funding agency: Ministry of Science (MEC): MICINN 2012, ECO2012-39098-C06-00.

Participating institutions: CSIC (Barcelona), UCM, University of Vigo, University of the Basque Country, Norwegian University of Science and Technology, University of Helsinki.

Project period: 01/02/2013-01/02/2016

Funding: 19500€

PI: María José Gutiérrez Huerta

Number of participants: 7

Title: UCM grant for the UCM-Research Group “Applied Mathematical Economics (ECOMAP)”

Funding agency: UCM-Santander Bank (GR3/14)

Participating institutions: UCM-Santander Bank

Project period: 2014-2015

Funding: 1099,23€

PI: Manuel Morán Cabré

Number of participants: 8

Title: Stochastic calculus with applications to Social Sciences

Funding agency: MEC (MTM2009-12672)

Participating institutions: UCM

Project period: 01/01/2010-01/01/2013

Funding: 39900€

PI: Manuel Morán Cabré

Number of participants: 6

Title: Nonlinear stochastic equilibria: economic and environmental applications

Funding agency: MEC (MTM2006-02372)

Participating institutions: UCM

Project period: November 2006- November 2009

Funding: 45250€

PI: Manuel Morán Cabré

Number of participants: 7

Title: Dynamics and geometry of stochastic equilibria

Funding agency: MEC (BMF2003-08204)

Participating institutions: UCM

Project period: November 2003- November 2006

Funding: 39600€

PI: Manuel Morán Cabré

Number of participants: 6

Title: Separation of deterministic components in time series processing

Funding agency: MEC (BX2000-0639)

Participating institutions: UCM

Project period: November 2000- November 2003

Funding: 25200€

PI: Manuel Morán Cabré

Number of participants: 4

Title: Analysis of spatial correlations in time series

Funding agency: MEC (DGES PB97-031)

Participating institutions: UCM

Project period: January 1998-November 2000



Funding: 13222.26€

PI: Manuel Morán Cabré

Number of participants: 4



C.5. Participation in international research projects

Title: Ecosystem-Economic Interactions in the Norwegian Sea: Analysis and Management (EINSAM)

Funding agency: Research Council of Norway (NFR), project no. 234238/E40

Participating institutions: Norwegian School of Economics (NHH), Institute of Marine Research (IMR, Bergen), University of Helsinki, University of Iceland y UCM.

Project period: 2014-2016

Funding: NOK 3 million (313555€)

PI: Sturla Kvamsdal

Number of participants: 8

Title: Bioeconomic Multispecies Analysis of Marine Ecosystem (BMAME)

Funding agency: Research Council of Norway (NFR), project no. 196433/S40

Participating institutions: Norwegian School of Economics (NHH), Institute of Marine Research (IMR, Bergen) y UCM.

Project period: 01/01/2010-31/12/2013

Funding: 8800000 NOK (1173000€)

PI: Leif Sandal

Number of participants: 6

Title: A General Age-structured Model for Ecosystem Management (AGAMEM)

Funding agency: Research Council of Norway (NFR), project no. 216571

Participating institutions: Norwegian School of Economics, Moscow State University, Institute of Marine Research (IMR, Bergen), NTNU y UCM.

Project period: 01/01/2012-01/01/2016

Funding: 8450000 NOK (1126000€)

PI: Stein Ivar Steinshamn

Number of participants: 8

C.6. Communications in international conferences

Title: Lipschitz continuous dynamic programming with discount

Organizing entity: Spanish Economic Association (SAEe)

Conference: XXVIII Symposium of Economic Analysis

Place: Sevilla, 13/12/2003

Title: Lipschitz continuous dynamic programming: Optimal exploitation of renewable resources with presence of increasing returns

Organizing entity: European Association of Environmental and Resource Economists (EAERE)

Conference: XIII Annual Conference of the EAERE

Place: Budapest (Hungria), 28/06/2004

Title: Lipschitz continuous dynamic programming: Optimal exploitation of renewable resources

Organizing entity: U. Castilla la Mancha

Conference: NOLINEAL 2004

Place: Toledo, 01/06/2004

Title: Stochastic dynamic programming: optimal management of renewable resources with presence of increasing returns

Organizing entity: Spanish-Portuguese Association of Resource and Environmental Economics (AERNA)

Conference: I AERNA Conference

Place: Vigo, 19/06/2004

Title: Increasing marginal returns in the optimal management of renewable resources

Organizing entity: European Association of Environmental and Resource Economists (EAERE)

Conference: XIV Annual Conference of the EAERE

Place: Bremen, 23/06/2005



Title: Optimal management of fisheries with non-enforced regulation

Organizing entity: The International Society for Ecological Economics (ISEE)

Conference: Ninth Biennial Conference of the ISEE "Ecological Sustainability and Human Well-Being"

Place: Nueva Delhi, 15/12/2006

Title: Optimal management of fisheries with non-enforced regulation based on the Precautionary Approach

Organizing entity: Spanish Economic Association (SAEe)

Conference: XXXII Symposium of Economic Analysis

Place: Granada, 13/12/2007

Title: Increasing marginal returns and the danger of collapse of commercially valuable fish stocks

Organizing entity: Spanish-Portuguese Association of Resource and Environmental Economics (AERNA)

Conference: III AERNA Conference

Place: Palma de Mallorca, 04/06/2008

Title: Optimal management of fisheries with non-enforced regulation based on the precautionary approach

Organizing entity: The International Society for Ecological Economics (ISEE)

Conference: Applying Ecological Economics for Social and Environmental Sustainability

Place: Nairobi, 07/08/2008

Title: Potential collapse in fisheries with increasing returns and stock-dependent costs

Organizing entity: Spanish-Portuguese Association of Resource and Environmental Economics (AERNA)

Conference: IV AERNA Conference

Place: Las Palmas de Gran Canaria, 02/06/2010

Title: Potential collapse in fisheries with increasing returns and stock-dependent costs

Organizing entity: Spanish Economic Association (SAEe)

Conference: XXXVI Symposium of Economic Analysis

Place: Málaga, 14/12/2011

Title: Modeling the population dynamics of fish stocks at low population sizes: The case of the Northern cod

Organizing entity: World Council of Fisheries Societies (WFC)

Conference: 6th World Fisheries Congress

Place: Edimburgo, 07/05/2012

Title: Modeling the population dynamics of fish stocks at low population sizes: The case of the Northern cod

Organizing entity: The International Society for Ecological Economics (ISEE)

Conference: Ecological Economics and Rio+20

Place: Rio de Janeiro, 16/06/2012

Title: Modeling the population dynamics of fish stocks at low population sizes: The case of the Northern cod

Organizing entity: International Institute of Fisheries Economics and Trade (IIFET)

Conference: IIFET's 16th Biennial Conference

Place: Dar es Salaam, 16/07/2012



C.7. Invited conferences in universities, seminars and workshops

Title: Lipschitz continuous dynamic programming with discount

Organizing entity: Centre for Applied Research (SNF)

Conference: Research seminar

Place: Bergen, 2003

Title: Lipschitz continuous dynamic programming with discount

Organizing entity: U. Zaragoza (UNIZAR)

Conference: Research seminar

Place: Zaragoza, Febrero, 2005

Title: Sobre el peligro de extinción en especies schooling

Organizing entity: College of Economists of A coruña

Conference: VII National Congress on Economy

Place: A Coruña, 30/09/2005

Title: Non-concavities in some economic problems: a dynamic programming approach

Organizing entity: Southern Methodist University (SMU)

Conference: Research seminar

Place: Dallas (USA), 2005

Title: Optimal management of fisheries with non-enforced regulation

Organizing entity: Department of Economic Analysis I, University of the Basque Country (UPV)

Conference: Research seminar

Place: Bilbao, 16/03/2007

Title: Comment on the paper “The Evaluation of Fisheries Management: A Dynamic Stochastic Approach”

Organizing entity: Santander Bank Foundation

Conference: XXI Moneda y Crédito Symposium: Economic Policy Evaluation

Place: Madrid, 14/11/2008

Title: Sobre el peligro de colapso de especies en presencia de rendimientos marginales crecientes (no-concavidades)

Organizing entity: Department of Quantitative Economics, Autónoma University of Madrid (UAM)

Conference: Research seminar

Place: Madrid, 30/04/2009

Title: Invited Expert

Organizing entity: Research Group in Economic Analysis (RGEA, UVIGO)

Conference: Workshop on advances in integrated biological & economic models for fisheries assessment

Place: Vigo, 22/07/2011

Title: Invited Expert

Organizing entity: Research Group in Economic Analysis (RGEA, UVIGO)

Conference: II Workshop on Age-structured Models in Fishery Economics and Bioeconomic Modelling

Place: Vigo, 05/11/2011

Title: Equilibrium versus collapse in age-structured models: The case of the Northern cod

Organizing entity: Department of Business and Management Science, Norwegian School of Economics (NHH)

Conference: Workshop on Age-structured Models

Place: Bergen (Noruega), 13/06/2012

Title: Some Problems in Natural Resources Economics; Analysis of collapsed species: The case of the Northern cod stock

Organizing entity: IMI-Institute of Interdisciplinary Mathematics, UCM.

Conference: Research seminar

Place: Madrid, 05/02/2014

Title: Biodynamics and limit reference points in collapsed fisheries: The case of the Northern cod stock



Organizing entity: Department of Quantitative Economics (UAM)

Conference: Research seminar

Place: Madrid, 07/02/2014

Title: A bridge between continuous and discrete-time bioeconomic models: Seasonal fisheries

Organizing entity: IMI-Institute of Interdisciplinary Mathematics, UCM.

Conference: Research seminar

Place: Madrid, 26/06/2015

Title: A bridge between continuous and discrete-time bioeconomic models: Seasonal fisheries

Organizing entity: José M^a Maroto (PI), NILS Science and Sustainability. European Project (ES07 – EEA Grants) (021-ABEL-CM-2013)

Conference: NILS Science and Sustainability International Seminar on Continuous vs. Discrete-Time Bioeconomic Models: Seasonal Fisheries

Place: UCM, Madrid, 17/11/2015

Díptico: forthcoming in the [web of ECOMAP](#)

Title: Seasonality in fisheries: A bridge between continuous and discrete-time bioeconomic models

Organizing entity: ICMAT-Instituto de Ciencias Matemáticas del CSIC, Universidad Autónoma de Madrid (UAM)

Conference: Workshop Mathematical Perspectives in Biology

Place: Madrid, 05/02/2016

Title: Bioeconomic modeling of seasonal fisheries: A reinterpretation of the Equilibrium

Organizing entity: ICMAT-Institute for Mathematical Sciences of CSIC, UAM

Conference: Research seminar

Place: Madrid, 03/06/2016

Title: Equilibrium, collapse and extinction in age-structured models

Organizing entity: José M^a Maroto (PI), UCM (Special Research Actions Program) (AEC9/17-20712)

Conference: International Seminar on Age-Structured Population Dynamics Models

Place: Madrid, 02/11/2017

Díptico:

<https://blogs.upm.es/dma/wp-content/uploads/sites/144/2017/11/D%C3%ADptico-15x21-seminario-ucm-2017.pdf>

Title: Equilibrio, colapso y extinción en modelos estructurados por edades: el caso del Bacalao del Norte

Organizing entity: Department of Quantitative Economics (UAM)

Conference: Research seminar

Place: Madrid, 13/12/2019

Title: Improving scientific advice for collapsed fisheries: Equilibrium and Transient Dynamics in Age-Structured Models

Organizing entity: Faculty of Economics at UCM

Conference: Research seminar

Place: Madrid, 24/02/2021
