MSc European Forestry

January 2024



MSc Spatial and Ecological modelling in European Forestry SEE-Forestry

The Med Environment in the Consortium:



Cristina Vega-Garcia/Lluís Coll

University of Lleida



Universitat de Lleida



About Lleida...





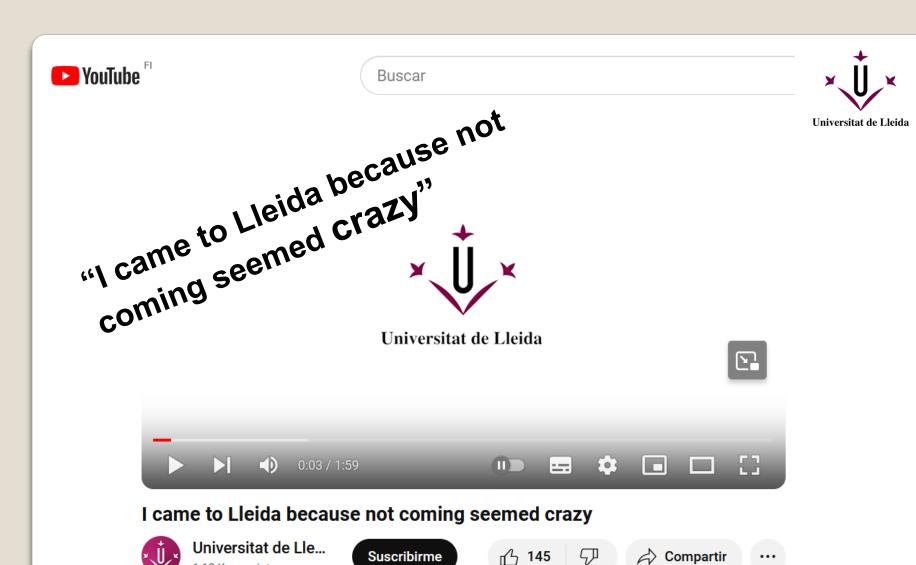
- √ South of the Pyrenees (100 km)
- ✓ Near to Barcelona (150 km)
- ✓ Mediterranean climate
- ✓ Population is 140.000











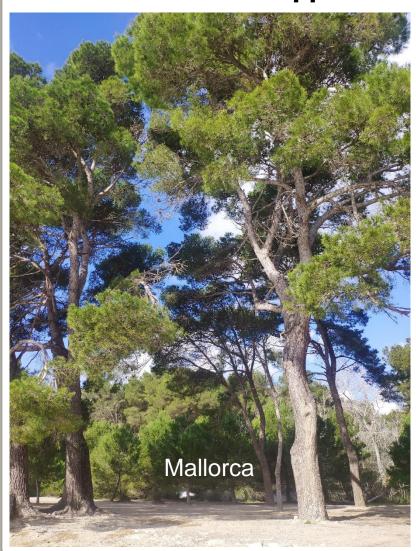
https://www.youtube.com/watch?v=4mOmo1Lp_j4&t=56s

1.18 K suscriptores

Location

Environmental gradient: From arid steppe lands to alpine high mountains







Our location is suitable for study and research in the fields of agriculture, stockbreeding, food tech and

environmental and forest sciences









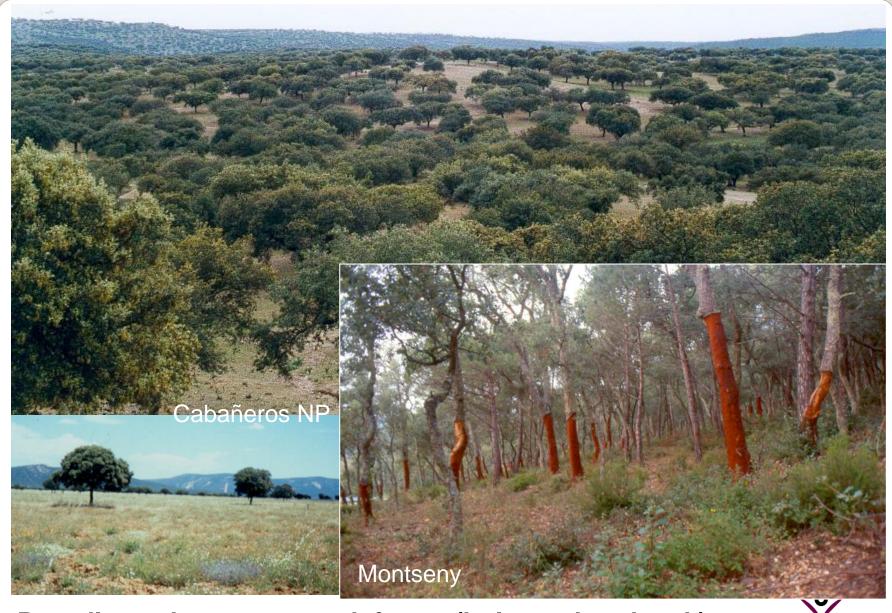
The topographic gradient allows for a great diversity in forest and wildland environments: coastal, grasslands, riparian, shrublands, woodlands, forest:





Forest dominated by deciduous or semideciduous thermophilous species, mainly *Quercus pubescens*





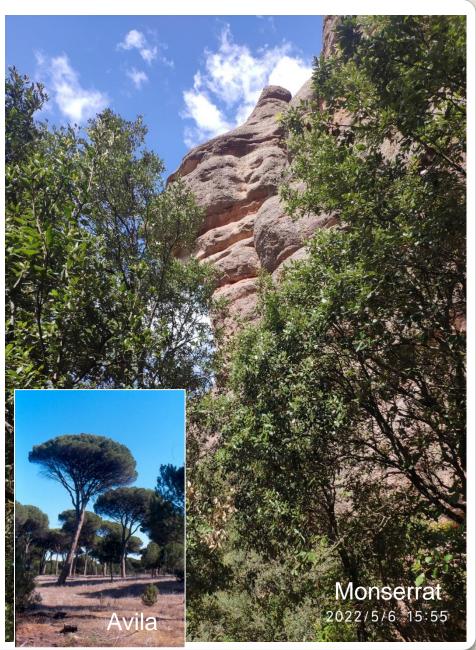
Broadleaved evergreen oak forest (holm and cork oak)

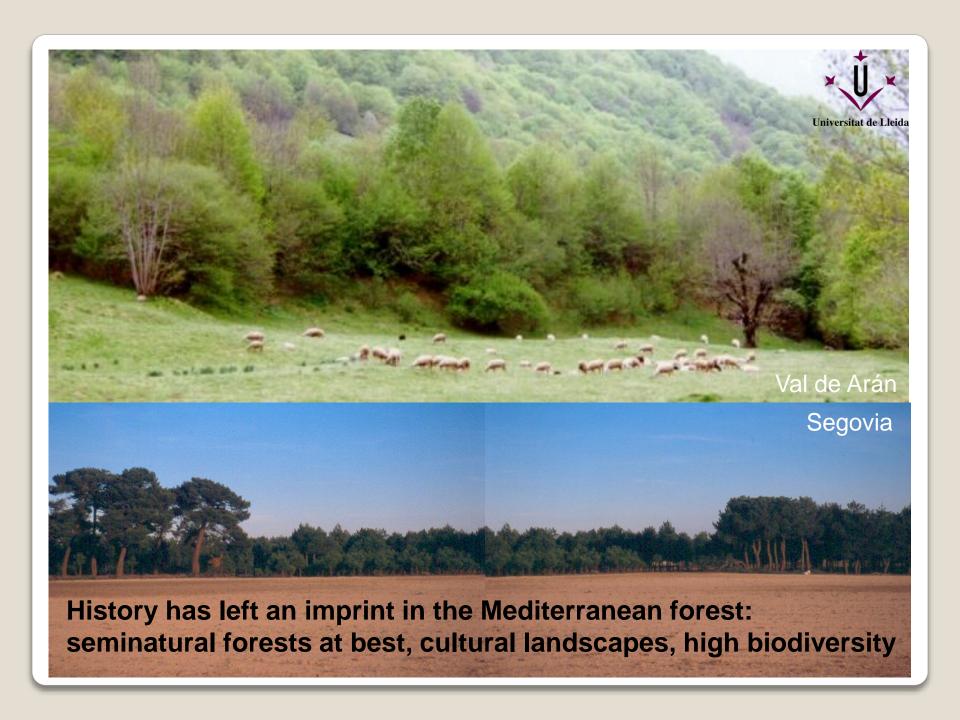






Xerophytic forests dominated by coniferous species (pines, firs, junipers, cypress)









Recently developed young forests challenging for silviculture and forestry





University of Lleida



The main aim of the University of Lleida is provide high standards of teaching with quality services throughout the university community that reach society beyond the campus gates. Students make up most of the UdL community, and our objective is to ensure that they enjoy the teaching and learning processes involved.



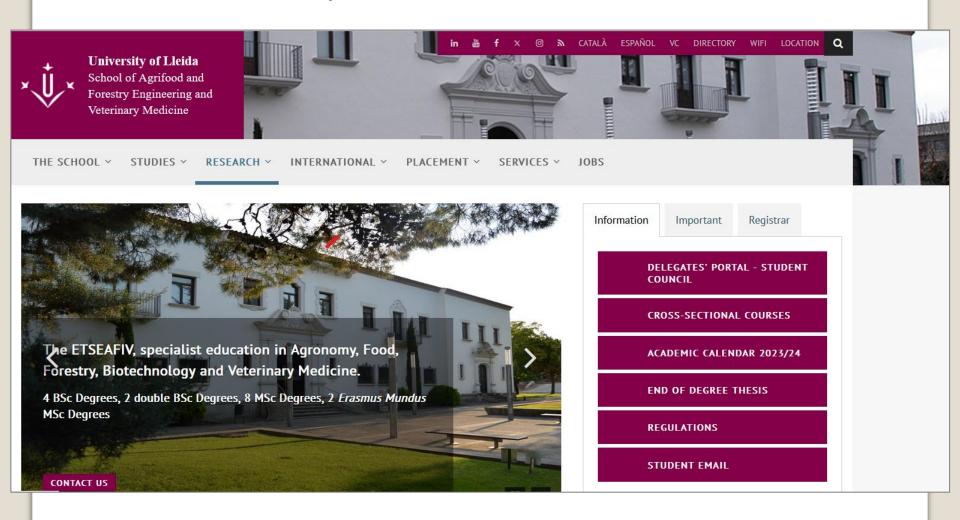
- ✓ Founded in 1297
- √ 7 Faculties and 2 affiliated centers
- √ 4 Centers of technological innovation
- √ 30 Scientific-

Technological Services

- √ +100 Research groups
 and +800 researchers
- **√11.000** Students
- √ 10 Students/Teacher

Excellent ratio student/teacher

School of Agrifood and Forest Engineering and Veterinary Medicine (ETSEAFIV) Universitat de Lleida



Facilities & Campus



THE World University Rankings 2021

- World Ranking: posición 601-800 entre 1.527 universidades
- National Rank: posición 9 entre 50 universidades

THE Impact Rankings 2020

- Ranking: posición 301-400 entre 767 universidades
- SDG 4 Educación de Calidad: posición 21 entre 676 universidades
- SDG 5 Igualdad de género: posición 94 entre 548 universidades
- SDG 7 Energía asequible y no contaminante: posición 201-300 entre 361 universidades
- SDG 10 Reducción de las desigualdades: posición 101-200 entre 459 universidades
- SDG 17 Alianzas para lograr los objetivos: posición 401-600 entre 807 universidades

THE Europe Teaching Ranking 2019

■ Posición 151 - 200 entre 258 universidades

THE World University Rankings by Subject 2021

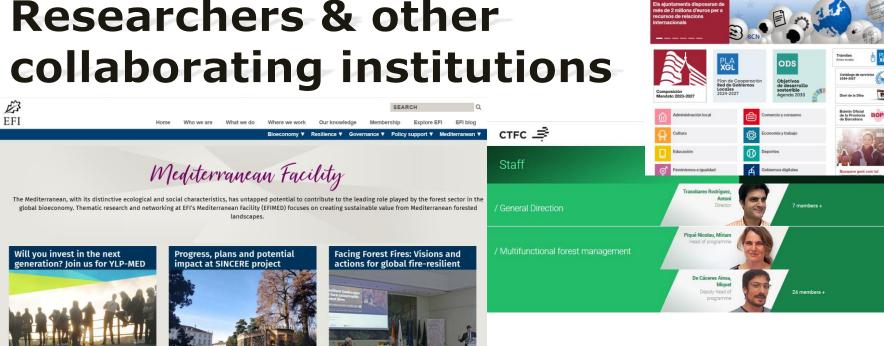
- Arts and Humanities: posición 401-500 entre 565 universidades
- Clinical and Health: posición 601+ entre 856 universidades
- Education: posición 301-400 entre 537 universidades
- Engineering: posición 301-400 entre 1098 universidades
- Life Sciences: posición 401-500 entre 895 universidades
- Social Sciences: posición 401-500 entre 791 universidades

U-Ranking 2020

- Global: 4a posición (junto con otras 7) entre 70 universidades
- Docencia: 3a posición (junto con otras 17) entre 70 universidades
- Investigación: 7a posición (junto con otras 9) entre 70 universidades



Researchers & other



Entities that form part of the Local Participation Group

Associació de Propietaris de les Comarques de Tarragona

Ajuntament del Montmell

Young Leadership

Associació de Propietaris de l'Alt Empordà

Associació de Propietaris Forestals Berguedà Verd

Diputació de Barcelona

Associació d'Iniciatives Rurals de Catalunya (ARCA)

Associació per la Gestió Forestal de la Baronia de Rialb

Ajuntament de la Baronia de Rialb

Serveis Territorials del DARP

Associació de Propietaris Forestals Serra Miralles-Orpinell

Ajuntament de Vallcebre









Forest Functioning & Dynamics



Diputació Barcelona

De Cáceres Ainsa, Miguel Vegetation Modeling



Piqué Nicolau, Miriam Sustainable forest management



Pere A. Soils and fertilizers

Researchers / Specialists



Améztegui González, Aitor Forest Functioning &



Beltrán Barba. Mario Sustainable forest



Coello Gómez. Jaime Sustainable forest



Domènech Jardí Sustainable forest



Garcia Pausas Jordi



Taull Taull, Marc

Part of the Campus IBERUS of **International Excellence**





Campus Iberus

Our programmes

BSc Degrees

- ✓ Biotechnology
- ✓ Animal Health and Science & Veterinary Sciences
- √ Food Science and Technology
- ✓ Agricultural and Food Engineering
- ✓ Forest Engineering
- √ Forest Engineering and Nature Conservation

PhD Programmes

- ✓ Agriculture and Food Science and Technology
- √ Forests and Environmental Management

http://www.udl.cat/ca/estudis/doctorat/en/programes-de-doctorat/gestio-forestal-i-del-medi-natural/

Master Programmes Agr. & Food Science:

- ✓ Agri-Food Systems Research
- ✓ Agronomic Engineering
- ✓ Integrated Pest Management
- ✓ Management and Innovation in the Food Industry
- ✓ Plant Breeding
- √ Soil and Water Management
- ✓ Swine Health and Production

Master Programmes Forest Science:

MSc European Forestry-SEE Forestry Erasmus mundus

- ✓ MEDfOR Mediterranean Forestry and natural resources management Erasmu mundus
- ✓ MASTERFUEGO Wildland Fire: Science and Management
- ✓ MSc Forest Engineering



European Forestry in Lleida

Modular programme

Year 1

Module 1 – Professional Knowledge Improvement, 12 ECTS

- Trends in European Forestry, 5 ECTS
- Academic Skills in Forest Sciences, 1.5 ECTS
- Research Methodology in Forest Sciences, 3.5 ECTS
- Global Virtual Seminar, 2 ECTS

Module 2 – Practical perspective and industrial visits, 18 ECTS

- European Forestry Field Course, 8 ECTS
- Applied Period in Forest Institutions, 10 ECTS

Elective Courses, 30 ECTS

Year 2

Module 3 – Specialization within Study Tracks, 30 ECTS, MSc Thesis and Online Thesis Seminar, 30 ECTS

- Track 1: Decision support systems for resource management
- Track 2: Resource management for ecosystem services
- Track 3: Spatial and ecological modelling
- Track 4: Resource economics and policy
- Track 5: Forest silviculture and engineering
- Track +: Global perspective

European Forestry Forum, Graduation Ceremony

The University of Lleida offers three online courses, which our students will be able to choose during the 1st or 2nd academic year: But not this year...

| Online course name | ECTS |
|---|------|
| 111017_Forest dynamics in a global change context: drivers, processes and | 5 |
| modelling approaches | |
| 111018_Stand to Continental Forest Health Management | 5 |
| 111019_Introduction to Spatial Statistics: Spatial analysis with R | 5 |



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List of Tracks:

- <u>Track 1</u>: Decision support systems for resource management (Coordinator AgroParisTech), including Forest Informatics and Precision forestry.
- <u>Track 2</u>: Resource management for ecosystem services (Coordinator: BOKU), including Carbon resource management, Resource efficient bio-resource analysis, Precision forestry.
- <u>Track 3</u>: Spatial and Ecological modelling (Coordinator: University of Lleida), including Production ecology, and Spatial modelling technology, Natural hazards and risks.
- <u>Track 4</u>: Resource economics and policy (Coordinator: University of Freiburg), including Applied forest bio-economy, Environmental policy/governance, New bio-materials and Economics of multipurpose forestry.
- <u>Track 5</u>: Silviculture and Engineering in Eastern Europe (Coordinator: TU Brasov developed during the first 2 years).
- <u>Track +</u>: Global perspective (a standard track 1, 2, 3 or 4 in Europe + additional studies with global Associate Partners in Canada, China, or Brazil).

List of Elective Courses SEE Forestry:



| Groups | Code | Course name | ECTS |
|--|--------|---|------|
| Methods and tools in spatial analysis and ecological modelling (27 ECTS) | 111001 | ST in Mapping and Monitoring Forest Natural Resources | 3 |
| | 111002 | ST in Spatial Statistics | 5 |
| | 111003 | ST in Methods in Hazard Analysis and Risk Assessment | 3 |
| | 111004 | ST in Global Environmental Change and invasive species | 3 |
| | 111005 | ST in Precision Forestry | 3 |
| | 111006 | ST in Multi-Scale Forest Dynamics Models | 5 |
| | 111022 | ST in Data management and visualization with R | 5 |
| Understanding Spatio- Temporal ecological processes (23 ECTS) | 111007 | ST in The Earth system in a time of change | 5 |
| | 111008 | ST in Landscape Ecology and Biological Connectivity | 5 |
| | 111009 | ST in Biodiversity and Ecology | 5 |
| | 111010 | ST in Disturbance Ecology and Forest Health | 5 |
| | 111021 | ST in Molecular forest ecology: from genes to management | 3 |
| Multi-Scale Management of Natural Resources (20 ECTS) | 111011 | ST in Resource Management and Planning for Ecosystem Services | 5 |
| | 111012 | ST in Decision Support Systems for Resource Management | 3 |
| | 111013 | ST in Forest Research & Development | 3 |
| | 111014 | ST in Bio-economy and Principles of Environmental sustainability | 3 |
| | 111015 | ST in Markets and Payments for Ecosystem Services | 3 |
| | 111016 | ST in European Resource Economics and Policy | 3 |

European Forestry in Lleida

https://europeanforestry.udl.cat/en/pla-formatiu/pla-estudis-guies-docents/

These courses are designated as Special Topics (ST). Contents may be adapted to the needs of the students according to their academic goals and the Master Thesis topic. Instructors and contents may vary within the thematic limits of a Special Topic field yearly.







- ✓ Potential for agro-forestry alley-cropping with valuable broadleaves in Central Catalonia
- ✓ Road metrics and fuels to optimize forest fire control
- ✓ Adult sampling and larva rearing of the cork oak pest *Coraebus undatus* (Coleoptera: Buprestidae)
- ✓ An analysis of wildlife suppression resources in 1998-2008 in Spain
- ✓ Assessing post-fire regeneration in a Mediterranean mixed forest using LIDAR technology and Artificial Neural Networks
- ✓ On the relationship between wildfires and reforestation in 1998-2008 in Spain
- ✓ Soil erosion modeling in an agro-forested catchment of NE Spain affected by gullying using SWAT
- ✓ A mobile terrestrial laser scanning application for characterizing Mediterranean vegetation structure along forest roads.
- ✓ Modelling nutrient cycling and *Pinus radiata (D. Dau)* growth under various management systems
- ✓ Genetic variation in water extraction patterns among populations of Aleppo pine: contributing sources to water consumption under common garden conditions in Eastern Spain
- ✓ Soil organic carbon dynamics after grassland abandonment in Alpine and Mediterranean mountains in North- Eastern Spain
- ✓ Decay fungi related to "Roig" red stain of *Castanea sativa* in Catalonia A qualitative assessment of the fungi associated with the notorious Roig.
- ✓ Analysis of hydrologic regime and land cover change in a "paired watershed" system
- ✓ Dead wood structures and tree microhabitats in *Pinus nigra* forests of varying management histories in Catalonia
- ✓ Comparison of sustainable forest management on the VPA and FSC standard in Cameroon



Recent MSc topics

2019

- ✓ Spatial prioritization of management zones within protected areas for integration of competing objectives
- ✓ Modeling the influence of eucalypt plantations on wildfire occurrence and propagation in western Brazil
- ✓ Endophytic community responses associated with *Diplodia* shoot blight on four *Pinus* spp. in NW Spain
- ✓ Estimation of carbon stock and carbon sequestration of community forest in Siwalik region of Nepal
- ✓ The relationship between price and forest stands characteristics: a case
 study in a Romanian private company

- ✓ Point Cloud Based Algorithm for Individual Tree Detection
- ✓ Analysis of the management interventions for forest fire prevention in "ZAP" (Zones d'Actuació Prioritària) of Province of Barcelona
- ✓ Planning evacuation routes for wildfires in Central Catalonia by analysing transport networks under extreme fire behavior.



Recent MSc topics

- ✓ The influence of thinning intensity and frequency on growth and provision
 of ecosystem services in Mediterranean mountain pine forest under climate
 change scenario.
- ✓ Future climate change in Finland: The influence of teleconections on fire weather index
- ✓ Analysis of forest fire dynamics and contributing factors in Sweden and Finland over 2010-2019.
- ✓ Fire danger pathways under climate change and management scenarios



Recent MSc topics

- ✓ Response of ecosystem services to close-to-nature and traditional forest management in sub-humid Mediterranean forests
- ✓ Connectivity of protected areas in Colombia: Identification and prioritization of potential corridors.
- ✓ Do individual PES buyers care about additionality and free-riding? A choice experiment
- ✓ Anticipating future extreme wildfire events by predicting ignition probability and success in initial attack in Catalunya
- ✓ Modelling Commercial Thinning (CT) regimes for timber production in interior British Columbia, Canada



Recent MSc topics

2023

- ✓ Economic Valuation of Ecosystem Services in Mediterranean Pine Forests
- ✓ Greenhouse gas fluxes across climatic gradients in mountain National Parks of the Iberian Peninsula.
- ✓ Impacts of forest management and climate change on wood products carbon emissions

✓ Runofff control potential of MRW-based green roof under Mediterranean

climate



Thesis output/format

Open Access Article

Lessons Learned from Arson Wildfire Incidence in Reforestations and Natural Stands in Spain

by **8** Emmanuel Da Ponte ^{1,*} ☑ ¹⁰, **8** Sergi Costafreda-Aumedes ² ¹⁰ and **8** Cristina Vega-Garcia ^{3,4} ¹⁰

- 1 German Aerospace Center (DLR), German Remote Data Center (DFD), Münchener Str. 20, 82234 Wessling, Germany
- ² Department of Agriculture, Food, Environment and Forestry (DAGRI), University of Florence, Piazzale delle Cascine 18, 50144 Florence, Italy
- ³ Department of Agricultural and Forest Engineering, University of Lleida, Av. Alcalde Rovira Roure, 191, 25198 Lleida, Spain
- ⁴ Forest Sciences Centre of Catalonia, Ctra. Sant Llorenç de Morunys km 2, Solsona 25280, Spain
- * Author to whom correspondence should be addressed.

Forests 2019, 10(3), 229; https://doi.org/10.3390/f10030229

Submission received: 25 January 2019 / Revised: 22 February 2019 / Accepted: 28 February 2019 / Published: 5 March 2019

(This article belongs to the Section Forest Ecology and Management)

Open Access Article

Modeling the Influence of Eucalypt Plantation on Wildfire Occurrence in the Brazilian Savanna Biome

by <a>8 Luiz Felipe de Castro Galizia 1,2 <a>1,2 <a>1,0 <a>0 and <a>0 Marcos Rodrigues 1,3,* <a>0 <a>0</

- Department of Agriculture and Forest Engineering, University of Lleida, Alcalde Rovira Roure 191, 25198 Lleida, Spain
- ² Faculty of Science and Forestry, School of Forest Sciences, University of Eastern Finland, P.O. Box 111, FI-80101 Joensuu. Finland
- ³ Joint Research Unit CTFC-AGROTECNIO, Ctra. Sant Llorenç, km. 2 25280 Solsona, Spain
- * Author to whom correspondence should be addressed.

Forests 2019, 10(10), 844; https://doi.org/10.3390/f10100844

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(This article belongs to the Special Issue Dynamic Modelling and Risk Assessment of Wildfire)

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Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman



Research article

Trajectories of wildfire behavior under climate change. Can forest management mitigate the increasing hazard?

Lauma Elza Miezïte ^{a, b}, Aitor Ameztegui ^{b, c}, Miquel De Cáceres ^d, Lluís Coll ^{b, c}, Alejandra Morán-Ordóñez ^{d, e}, Cristina Vega-García ^{b, c}, Marcos Rodrigues ^{f, g, *}

- a University of Eastern Finland, Department of Geography and Land Management, Joensuu, Finland
- b University of Lleida, Department of Agricultural and Forest Engineering, Lleida, Spain
- GIRU CTFC-Agrotecnio-CERCA, 25280 Solsona, Lleida, Spain
- d Ecological and Forestry Applications Research Centre (CREAF), Edifici C Campus de Bellaterra, 08193, Cerdanyola Del Valles, Spain
- Forest Science and Technology Centre of Catalonia (CTFC), Ctra. St. Llorenç de Morunys, Km. 2, 25280, Solsona, Spain
- f University of Zaragoza, Department of Geography and Land Management, Zaragoza, Spain
 g GEOFOREST Research Group, University Institute for Environmental Sciences, IUCA, India

Check for updates



European Forestry in Lleida



Student Support (ORI & MScEF Assistant), Anna Fontova:

- ✓ One scholarship for self-paying students (2000 €)
- ✓ Semester: mid-September-January; Feb-June (Sep)
- √ Thesis deadline 30th September but we aim for JUNE
- ✓ Encourage attendance to conferences or other academic events

Open Access Abstract Open Access Abstract Fire Behavior Pathways under Climate Change and Management Anticipating Future Extreme Wildfires by Predicting the Probability of Ignition and Escape of Initial Attack in Catalunya † Scenarios † by (a) Lauma Elza Miezīte 1 (b), (a) Aitor Ameztegui 2 and (b) Marcos Rodrigues 3,* 🖾 (b) by Fellice Gabrielle Catelo 1,* Marcos Rodrigues 2 and Aitor Ameztegui 1 Department of Forest Sciences, University of Eastern Finland, 70211 Kuopio, Finland Department of Agriculture and Forest Engineering, University of Lleida, 25003 Lleida, Spain ² Department of Agricultural and Forest Engineering, University of Lleida, 25003 Lleida, Spain 2 GEOFOREST Group, Instituto Universitario de Investigación en Ciencias Ambientales de Aragon (IUCA), Department of Geography and Land Management, University of Zaragoza, 50009 Zaragoza, Spain ³ Department of Geography and Land Management, University of Zaragoza, 50009 Zaragoza, Spain * Author to whom correspondence should be addressed. * Author to whom correspondence should be addressed. † Presented at the Third International Conference on Fire Behavior and Risk, Sardinia, Italy, 3–6 May 2022. † Presented at the Third International Conference on Fire Behavior and Risk, Sardinia, Italy, 3–6 May 2022. Environ. Sci. Proc. 2022, 17(1), 109; https://doi.org/10.3390/environsciproc2022017109 Environ. Sci. Proc. 2022, 17(1), 87; https://doi.org/10.3390/environsciproc2022017087 Published: 30 August 2022 Published: 17 August 2022 (This article belongs to the Proceedings of The Third International Conference on Fire Behavior and Risk) (This article belongs to the Proceedings of The Third International Conference on Fire Behavior and Risk) Download > Versions Notes Download ✓ Versions Notes Keywords: wildfire occurrence; initial attack; wildfire prediction; wildfire management; Mediterranean Keywords: fire behavior; climate scenarios; forest management; vegetation dynamics

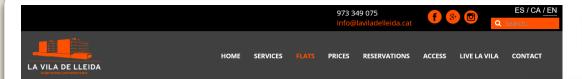
European Forestry in Lleida



Student Support (ORI & MScEF Assistant), Anna Fontova:

- ✓ Welcome week and cultural orientation, Sports Club
- ✓ 2 Residences & private flats ((150)200-350€ / month)
- ✓ Free Spanish & Catalan Languages Courses at the Lang. Institute-UdL





Residence

HOME / FLATS

Flats

La Vila de Lleida consists of 150 apartments of different types for 1 or 2 people. All the flats come complete with the following:

- Fully equipped bathroom
- Fully equipped kitchen and vitro-ceramic hotplate
- Microwave
- Fridge
- Hot water heater
- Desk and chairs
- Dining room table and chairs

- Wardrobe and shelving
- Phone and TV jack
- Free internet connection by RJ-45 connector
- · Air- conditioning
- Central heating
- Individual electricity and water meter
- Bed 200×90cms (single bed size)

TOUR ONLINE!

Tipos de viviendas



All the flats have outside views and are equipped ready for you to move in.





Habitación individual



Dos habitaciones individuales



Adaptados de una habitación

Imágenes









More info: Cristina Vega-Garcia, cristina.vega@udl.cat Lluís Coll, lluis.coll@udl.cat



Thanks!!!



