International Workshop on Wildfire Modeling & AI
March 17 - 18, 2025

Held at
The Royal Spanish Academy of Sciences
Calle Valverde 22, 28004, Madrid

AGENDA

DAY 1: March 17, 2025

9:00 AM – 10:00 AM	**Coffee and Networking**
10:00 AM – 10:45 AM	**Welcome Remarks** **Brief Introductions of Workshop Participants** *Ana Crespo, Royal Spanish Academy of Sciences* *Ourania (Rania) Kosti, InterAcademy Partnership Secretariat, U.S. National Academies of Sciences, Engineering, and Medicine (USA)* *José M. Moreno, Royal Spanish Academy of Sciences*
10:45 AM – 11:10 AM	**Workshop Goals** **Overview of the Agenda** *Hussam Mahmoud, Colorado State University (USA)*
11:10 AM – 11:40 AM	**Perspectives on wildfire early warning, monitoring and risk assessment** *Jesus San Miguel, European Commission Joint Research Center*
11:40 AM – 12:00 PM	**Coffee Break** **Picture with workshop participants**
12:00 AM – 12:40 PM	**Session 1: Wildland Fire Behavior and Observations** This session will explore the dynamics of wildfires, including their causes, patterns and processes associated with their propagation as well as the impact of global climate on shifting fire regimes. *Moderator: Andrey Krasovskiy, IIASA (Austria)* 1.1 Right Model, Right Data, Right Time: An Open Science Workflow Approach for Actionable Fire Modeling *Ilkay Altintas, University of California San Diego (USA)* *1.2* Wildfires in the rural environment of Spain at the crossroad of increased severe weather and fire hazard due to abandonment *José M. Moreno, Royal Spanish Academy of Sciences*
12:40 PM – 1:10 PM	**Session 1 Discussion**
1:10 PM – 2:30 PM	**LUNCH**

2:30 PM – 3:45 PM

Session 2: Modeling Wildland-Urban Interface Fires with Physics-Based Approaches

This session will explore the use of computational fluid dynamics to simulate localized fire behavior and the spread of fire in communities.

Moderator: Miguel Almeida, Universida de Coimbra (Portugal)

2.1 Using Fire Dynamics Simulator (FDS) to model wildland and urban interface fires.
Craig Weinschenk, Fire Safety Research Institute (USA)

2.2.1 Fire behavior at the WUI using physics-based models
2.2.2 Multicriteria assessment of WUI buildings' vulnerability
Eric Maillé, French National Institute for Agriculture, Food, and Environment, (France)

2.3 Assessing dwelling vulnerabilities with CFD simulations
Eulalia Planas, Polytechnic University of Catalonia, (Spain)

2.4 Dynamic fire propagation and extreme wildfire development
Jason Sharples, University of New South Wales (Australia)

3:45 PM – 4:15 PM **Session 2 Discussion**

4:15 PM - 5:00 PM **Reflections and Discussion on the Day's Sessions**
Adjourn Day 1

8:00 PM **Group Dinner for invited participants**
Restaurante Public
Calle del Desengaño 11 Madrid 28004
+34915220670
reservaspublic@andilana.com

DAY 2: March 18, 2025

9:00 AM – 10:00 AM	**Coffee**
10:00 AM – 10:05 AM	**Welcome** **Overview of Day 2** *Hussam Mahmoud, Colorado State University, (USA),*
10:05 AM – 11:15 AM	**Session 3: Modeling Wildland-Urban Interface Fires with Semi Physics-Based Models** This session will explore the use of physics-based models with simplified representation of the physical processes to describe fire behavior and spread in communities. *Moderator: Georgios Boustras, Centre for Risk Decision Sciences (Cyprus)* 3.1 A new granular and scalable model for stochastic WUI fire spread behaviour, risk assessment, and optimisation of extinction resources *Savvas Gkantonas, University of Cambridge (UK)* 3.2 AGNI-NAR: An asynchronous graph model for simulating built environment damage in the wildland urban interface *Hussam Mahmoud, Colorado State University (USA)* 3.3 Modelling Wildfire Impacts on Cities: Quantifying Threats to Buildings, Infrastructure, and Population Evacuation *Andres Valencia, University of Canterbury (New Zealand)*
11:15 AM – 11:45 AM	**Session 3 Discussion**
11:45 AM – 12:10 PM	**Break**
12:10 PM – 1:00 PM	**Session 4: Empirical, Logic, Statistical, and Artificial intelligence Analysis in Modeling Wildland-Urban Interface Fires** This session will explore how different logic and data interpretation approaches can be used to understand communities' vulnerabilities to wildfires. The session will also explore the use of artificial neural networks and statistical models to capture the relationship between dependent and independent variables to vulnerability to wildfires at a community scale. *Moderator: Fermín Alcasena, Universidad Pública de Navarra (Spain)* 4.1 Socioeconomic analysis of the wildland-urban interface: Designing resilient societies for wildfire risk *Maria Luis Chas, University of Santiago de Compostela (Spain)*

4.2 Evaluating wildfire vulnerability of dwellings using fuzzy logic and expert judgement approaches
Elsa Pastor, Polytechnic University of Catalonia (Spain)

4.3 Application of wildfire spread modeling to quantify wildfire impacts at WUIs
Michele Salis, National Research Council (Italy)

1:00 – 2:30 PM **LUNCH**

2:30 – 3:30 PM 4.4 Implementing low-complexity risk assessment models to monitor and prioritize WUI fire prevention in the Portuguese 2020-30 National Plan for Integrated fire management
Yannick Le Page, Portuguese Integrated Rural Fire Management Agency (Portugal)

4.5 Advanced Analytics tools for the Protection of Wildland-Urban Interface Against Wildfires
Rodrigo Mahaluf, Universidad de Chile (Chile)

4.6 Can Artificial Intelligence Enhance Wildfire Risk Awareness?
Paolo Fiorucci, CIMA Research Foundation (Italy)

3:30 PM – 4:00 PM **Session 4 Discussion**

4:00 PM – 4:20 PM **Break**

4:20 PM – 5:15 PM **Session 5: Breakout Guided Discussion**
Q1: What do you see as the major advantages and disadvantages of the modeling approach discussed in your session?

Q2: To the extent of your knowledge, how has the modeling approach discussed in your session been used for assessing or reducing wildfire vulnerability and risk reduction?

Q3: Has the implementation of this modeling approach been successful (i.e., are there any success stories) and what are the barriers towards full implementation.

5:15 PM – 5:40 PM **5-Minute Reporting per Breakout**

5:40 PM – 6:00 PM **Meeting Recap & Adjourn**

BIOGRAPHIC INFORMATION AND RELEVANT PUBLICATIONS

Dr. Fermín Alcasena is a Senior Researcher at the Public University of Navarre, where he focuses on wildfire risk management and environmental policy. He holds an MSc in Wildland Fire Science and Integrative Management, as well as a Ph.D. in Forest and Environmental Management. He began his research career at the CMCC Foundation in Italy, serving as a Research Assistant for a year before completing a three-year postdoctoral fellowship at Oregon State University under the USDA Forest Service J-1 International Visitor Program. Dr. Alcasena's main research interests include extreme fire modeling, landscape treatment optimization, and Wildland-Urban Interface (WUI) mapping, and he has published over 35 peer-reviewed papers that have collectively garnered more than 1,000 citations. He has delivered over 10 oral presentations at premier international conferences in wildfire science, participated in multiple international research projects, performed 40 peer reviews for 19 publications, and served as a reviewer for national research project calls in Spain and Portugal. In addition to his research endeavors, he has taught as a lecturer in forestry and landscape restoration and management at the Universitat Politècnica de Catalunya and the Universitat de Lleida in Spain. Prior to his academic career, he gained practical experience as an operations manager in a logging company, significantly contributing to public forest management in northern Spain. Drawing on this blend of hands-on expertise, advanced modeling techniques, and real-world data, Dr. Alcasena continues to advance wildfire science and forest management, effectively bridging academic research with practical applications.

- Bar-Massada, Alcasena F, Schug F, Radeloff V (2023) The wildland-urban interface in Europe: Spatial patterns and associations with socioeconomic and demographic variables. Landscape and Urban Planning. 235: 104759. Doi: 10.1016/j.landurbplan.2023.104759.
- Alcasena F, Ager A, Le Page Y, Bessa P, Loureiro C, Oliveira T (2021) Assessing Wildfire Exposure to Communities and Protected Areas in Portugal. Fire. 4(4): 82. Doi:10.3390/fire4040082.
- Ager A, Day M, Ringo C, Evers C, Alcasena F, Houtman R, Scanlon M, Ellersick Tania (2021) Development and application of the fireshed registry. Gen. Tech. Rep. RMRS-GTR-425. Fort Collins, CO: USDA, Forest Service, RMRS. 47 p. Doi: 10.2737/ RMRS-GTR-425.
- Ager A, Day Michelle, Alcasena F, Evers C, Short K, Grenfell I (2021) Predicting Paradise: Modeling future wildfire disasters in the western US. Science of The Total Environment. 784: 147057. Doi: 10.1016/j.scitotenv.2021.147057.
- Alcasena F, Ager, Alan A, Bailey J, Pineda N, Vega C (2019). Towards a comprehensive wildfire management strategy for Mediterranean areas: Framework development and implementation in Catalonia, Spain. Journal of Environmental Management. 231: 303-320. Doi: 10.1016/j.jenvman.2018.10.027.

Miguel Almeida holds a PhD in Natural and Technological Risks (2011) from the University of Coimbra, where he focused on wildfire spread through spotting. He previously earned an MSc in Environmental Management and Policies (2005) from the University of Aveiro, analysing fire propagation in heterogeneous fuel beds, and a degree in Environmental Engineering (1998) from the same institution. He is a senior investigator at the Association for the Development of

Industrial Aerodynamics, where he is a Member of the Board of Directors. Since 2021, he has been an Invited Assistant Professor at the University of Coimbra. Every two years, he contributes to the organization of the Boom Festival as Safety Director and is also a certified trainer at the National Firefighters School in Portugal. Since 2011, he has been an integrated member of LAETA: Associated Laboratory of Energy, Transports, and Aeronautics. Additionally, he is an expert member of the ISO42 Technical Committee on wildland-urban interface fire risk for building protection. His research is dedicated to fire behaviour and fire safety, with a particular focus in recent years on wildfire risk management in the wildland-urban interface. He has authored 32 journal articles, 31 book chapters, and two books. His academic contributions include organizing 21 scientific events and co-supervising two PhD theses and 17 MSc dissertations. He has also played key roles in numerous research projects, serving as Principal Investigator in three, Co-Principal Investigator in three, and a researcher in 23 projects.

- Almeida, R., Arca, B., Bacciu, V., Boca, R., Maianti, P., Branco, A., Oom, D. J. F., De Rigo, D., Roglia, E., Scionti, N., & Suarez-Moreno, M. (2023). *Analysis of 2021 critical wildfire events in the Mediterranean region*. Publications Office of the European Union. https://doi.org/10.2760/562495
- Almeida, M., Soviev, M., San-Miguel, J., Durrant, T., Oom, D., Branco, A., Ferrari, D., Boca, R., Maianti, P., De Rigo, D., Suarez-Moreno, M., Roglia, E., Scionti, N., Broglia, M., Alves, D., Matos, C., Ribeiro, L. M., Viegas, D. X., Ribeiro, C., Rodrigues, T., Chuvieco, E., Oliva, P., Garcia, M., Velea, R., Laterza, R., De Lucia, M., Lorenzoni, P., Arca, B., Salis, M., Bacciu, V., Del Giudice, L., Pelizzaro, G., Duce, P., Marrs, C., Forkel, M., Beetz, K., Kosczor, E., Podebradska, M., Politi, N., Sfetsos, A., Vlachogiannis, D., Eftychidis, G., Stavrakoudis, D., Varela, V., Gitas, I. Z., Sjostrom, J., Petrila, M., Lorent, A., Drobinkova, N., Vasilev, V., Tsvetkova, N., Yanko, B., Gospodinov, I., Zibtsev, S., Goldammer, J., Myroniuk, V., Sydorenko, S., Soshenskyi, O., Bogomolov, V., & Borsuk, O. (2024). *Report on the large wildfires of 2022 in Europe*. Publications Office of the European Union. https://data.europa.eu/doi/10.2760/19760
- Almeida, R., Arca, B., Bacciu, V., Boca, R., Maianti, P., Branco, A., Oom, D. J. F., De Rigo, D., Roglia, E., Scionti, N., & Suarez-Moreno, M. (2023). *Analysis of 2021 critical wildfire events in the Mediterranean region*. Publications Office of the European Union. https://doi.org/10.14195/978-989-26-2592-8

Dr. İlkay Altıntaş, at the University of California San Diego, is the Chief Data Science Officer of the San Diego Supercomputer Center as well as a Founding Faculty Fellow of the Halıcıoğlu Data Science Institute at the School of Computing, Information and Data Science. With a specialty in scientific workflows and systems, she leads collaborative teams to deliver impactful results and sustainable solutions through making computational data science and AI work more reusable, programmable, scalable, equitable, and reproducible. She is the Founding Director of the Workflows for Data Science Center for the development of methods and workflows for computational data science, and the WIFIRE Lab on AI methods for an all-hazards knowledge cyberinfrastructure. She is the PI of the NSF National Data Platform and other diverse NSF grants to develop scalable computing, AI and data systems at the digital continuum from edge to HPC. Altıntaş Ilkay received a Ph.D. degree from the University of Amsterdam and holds a joint appointment at Los Alamos National Lab. She serves as a Member of the Founding Boards of two community-oriented non-profits — “Data Science Alliance” and “Climate and Wildfire Institute”. Among the awards she has received are the 2015 IEEE TCSC Award for Excellence in Scalable Computing for Early Career Researchers and the 2017 ACM SIGHPC Emerging Woman Leader in Technical Computing Award. Ilkay serves on the elected Board of Governors

for the IEEE Computer Society, and was appointed by California Governor Newsom to the Wildfire Technology Research and Development Review Advisory Board.

María Luisa Chas Amil is Professor of Applied Economics at the University of Santiago de Compostela (USC). She holds a PhD in Economics from the USC and MSc in Forestry from the University of Wisconsin-Madison. Her research career has primarily focused on studying environmental issues driven by economic factors, particularly within the forestry, energy, and fishing sectors. More recently, her research has focused on disaster risk reduction management, with a particular emphasis on economic and social analysis of forest disturbances, such as wildfires. She also examines stakeholder participation in decision-making and the strategic behavior of natural resource users in both temporal and spatial context. She collaborates with interdisciplinary teams, using a range of statistical and econometric techniques to address environmental challenges. Her research aims to bridge the gap between economic analysis and environmental management, providing insights into the impacts of economic activities on natural resources. Additionally, her work emphasizes how stakeholders can be better engaged in decision-making processes to promote sustainable resource management.

- Lecina-Díaz J, Chas-Amil ML, Aquilué N, Sil Â, Brotons Ll, Regos A., Touza J (2023). Incorporating fire-smartness into agricultural policies reduces suppression costs and ecosystem services damages from wildfires. Journal of Environmental Management 337: 117707. https://doi.org/10.1016/j.jenvman.2023.117707
- Lecina-Díaz J, Campos JC, Pais S, Carvalho-Santos C, Azevedo JC, Fernandes P, Gonçalves JF, Aquilué N, Roces-Díaz J, Agrelo de la Torre M, Brotons Ll, Chas-Amil ML, Lomba Â, Duane A, Moreira F, Touza J, Hermoso V, Sil Â, Vicente J, Honrado J, Regos A (2023). Stakeholder perceptions of wildfire management strategies as Nature-based solutions in two Iberian Biosphere Reserves. Ecology & Society 28(1):39. https://www.ecologyandsociety.org/vol28/iss1/art39/
- **Chas-Amil, ML**, Nogueira-Moure, E., Prestemon, JP., Touza, J. (2022) Spatial patterns of social vulnerability in relation to wildfire risk and wildland-urban interface presence. Landscape and Urban Planning. 228, 104577. https://doi.org/10.1016/j.landurbplan.2022.104577
- Tedim, F., Leone, V., Lovreglio, R., Xanthopoulos, G., **Chas-Amil, M-L**., Ganteaume, A., Efe, R., Royé, D., Fuerst-Bjeliš, B., Nikolov, N., Musa, S., Milenković, M., Correia, F., Conedera, M., Pezzatti, G.B. (2022). Forest Fire Causes and Motivations in the Southern and South-Eastern Europe through the Expert Perception and Applications to Current Policies. Forests, 13, 562. https://doi.org/10.3390/f13040562

George Boustras is a Professor in Risk Assessment at European University Cyprus, Director of the Centre of Risk and Decision Sciences (CERIDES – Excellence in Innovation and Technology) and Visiting Researcher at the National Observatory of Athens. He is a Member of the EU Mission: Adaptation to Climate Change. He is a Special Advisor in Civil Protection and Crisis Management to HE the President of the Republic of Cyprus Nikos Christodoulides. He is Scientific Director of Civil Protection Programs, under Prime Minister of the Hellenic Republic, Kyriakos Mitsotakis. George is a PhD in Probabilistic Fire Risk Assessment from CFES at Kingston University London (2003), he was Honorary Research Fellow at CPSE at Imperial College London (2003 - 2005), and KTP Research Fellow at FSEG at the University of Greenwich (2009). He has advised Governments in Civil Protection reforms and has worked with World Bank, European Commission and Expertise France. George is Editor-in-Chief of

Safety Science (Elsevier, IF 6.392) and Member of the Editorial Board of Fire Technology (Springer Nature) and the International Journal of Critical Infrastructure Protection (Inderscience). He (co-)supervises 5 PhD students; 10 of his students are now PhD's. In May 2024 he received the "Distinguished Researcher Award" at the Annual Awards for Excellence in Research 2024 of European University Cyprus.

- Stoof C., Castellnou Ribau M., Moore P.F., Boustras G., To solve the global wildfire crisis, don't just focus on flames, (2025) Nature, 637 (8044), pp. 34
- Kirschner J.A., Steelman T.A., Charalambidou I., Gücel S., Petrou P., Papageorgiou K., Karayiannis A., Boustras G.,Uncharted territory: governance opportunities for wildfire management and the case of Cyprus (2024) International Journal of Wildland Fire , 33 (6), art. no. WF23177
- Kirschner J.A., Ascoli D., Moore P., Clark J., Calvani S., Boustras G., Governance drivers hinder and support a paradigm shift in wildfire risk management in Italy, (2024) Regional Environmental Change, 24 (1), art. no. 13
- Pandey P., Huidobro G., Lopes L.F., Ganteaume A., Ascoli D., Colaco C., Xanthopoulos G., Giannaros T.M., Gazzard R., Boustras G., Steelman T., Charlton V., Ferguson E., Kirschner J., Little K., Stoof C., Nikolakis W., Fernández-Blanco C.R., Ribotta C., Lambrechts H., Fernandez M., Dossi S., A global outlook on increasing wildfire risk: Current policy situation and future pathways, (2023) Trees, Forests and People, 14, art. no. 100431
- Kirschner J.A., Clark J., Boustras G., Governing wildfires: Toward a systematic analytical framework, (2023) Ecology and Society, 28 (2), art. no. 6 Boustras G., Ronchi E., Rein G., Fires: Fund research for citizen safety, (2017) Nature, 551 (7680), pp. 300

Paolo Fiorucci is a wildfire expert with extensive experience in risk assessment, prevention strategies, and emergency response coordination. He currently serves as the Associate Director at the CIMA Research Foundation, where he leads projects focused on wildfire prevention, sustainable forest management, and the development of early warning systems, particularly in the Mediterranean region. Throughout his career, Paolo has contributed to several initiatives and projects, developing risk mapping tools, policy recommendations, and capacity-building programs for local authorities and first responders. He collaborates with multidisciplinary teams to integrate scientific research, technology, and community engagement into effective wildfire mitigation strategies. His recent research focuses on the application of Artificial Intelligence in wildfire risk mapping, prediction and management. By leveraging machine learning models and remote sensing data, he has contributed to the development of AI-driven tools that enhance fire risk assessment, optimize resource allocation, and improve decision-making processes for emergency response teams. These innovative approaches are helping to improve the accuracy of fire spread models and provide real-time insights for more effective wildfire suppression strategies. Paolo has also been actively involved in knowledge dissemination, contributing to scientific publications, technical reports, and training activities aimed at strengthening wildfire preparedness at local and international levels. His work bridges the gap between research and operational needs, ensuring that scientific advancements translate into practical solutions for wildfire risk reduction.

Savvas Gkantonas is a visiting researcher at the University of Cambridge and the CEO of Pinepeak, a University of Cambridge spinout developing predictive technologies and data-driven solutions for wildfire risk assessment. Before founding Pinepeak, he was a Senior Research Associate in the Department of Engineering at Cambridge. Savvas has authored or co-authored

over 40 peer-reviewed articles in leading journals and conference proceedings. Known for his expertise in advanced numerical simulations of turbulent reacting flows, he has worked extensively with computational fluid dynamics and low-order methods to tackle fundamental and applied challenges in transport, power, human health, and the environment. In the field of wildfire, he co-invented a stochastic Lagrangian model to capture fire propagation in inhomogeneous terrains, including the wildland-urban interface (WUI), drawing inspiration from turbulent reacting flow modelling and jet engine ignition research. Savvas holds a PhD from the University of Cambridge and a double degree in engineering from the Aristotle University of Thessaloniki and Centrale Supélec.

- Mastorakos, E. (2022). Measurements and modelling of the three-dimensional near-field dispersion of particulate matter emitted from passenger ships in a port environment. *Proceedings of the Combustion Institute*. https://doi.org/10.1016/j.proci.2022.07.240
- Efstathiou, G., Gkantonas, S., Giusti, A., Mastorakos, E., Foale, C. M., & Foale, R. R. (2023). Simulation of the December 2021 Marshall fire with a hybrid stochastic Lagrangian-cellular automata model. *Fire Safety Journal*, 103795. https://doi.org/10.1016/j.firesaf.2023.103795
- Petersen, J. E., Kapur, S., Gkantonas, S., Mastorakos, E., & Giusti, A. (2023). Modelling and optimisation of extinction actions for wildfire suppression. *Combustion Science and Technology*, 195(14), 3584–3595. https://doi.org/10.1080/00102202.2023.2246195

Dr. Andrey Krasovskiy is a versatile mathematical modeler with expertise in simulations, control problems, and optimization, applied across a broad range of ecosystems and domains, including economics, technology, and the social sciences. His research primarily focuses on land use and forest modeling, with a particular emphasis on global wildland fires under climate change. Dr. Krasovskiy's career at the International Institute for Applied Systems Analysis (IIASA) began in 2006 when he was awarded the prestigious Mikhalevich Award. In 2012, he transitioned to the former Ecosystem Services and Management Program, and he now leads the FLAM team within the Agriculture, Forestry, and Ecosystem Services Research Group, contributing significantly to the Biodiversity and Natural Resources Program. As the primary developer of the Wildfire Climate Impacts and Adaptation Model (FLAM), a mechanistic fire model integrated into the IIASA biophysical model cluster, Dr. Krasovskiy plays a key role in projecting and assessing fire risk hot spots and burned areas combined with the evaluation of fire adaptation strategies in the context of climate change. His current focus is on improving modeling accuracy through the integration of remote sensing observations and ground data, alongside the use of AI technologies for model calibration and validation. His research interests also extend to dynamic optimization of economic growth and investment models, the evaluation of REDD+ offset programs with financial benefit-sharing mechanisms, wildlife population modeling, and permanence modeling.

- www.iiasa.ac.at/flam
- Krasovskii, A., Khabarov, N., Migliavacca, M., Kraxner, F., & Obersteiner, M. (2016). Regional aspects of modelling burned areas in Europe. *International Journal of Wildland Fire*, 25(8), 811–818. https://doi.org/10.1071/WF15012
- Khabarov, N., Krasovskii, A., Obersteiner, M., Swart, R., Dosio, A., San-Miguel-Ayanz, J., Durrant, T., Camia, A., & Migliavacca, M. (2016). Forest fires and adaptation options in Europe. *Regional Environmental Change*, 16, 21–30. https://doi.org/10.1007/s10113-014-0621-0
- Fernandez-Anez, N., Krasovskiy, A., Müller, M., Vacik, H., Baetens, J., Hukić, E., Kapovic Solomun, M., Atanassova, I., Glushkova, M., Bogunović, I., Fajković, H., Djuma,

H., Boustras, G., Adámek, M., Devetter, M., Hrabalikova, M., Huska, D., Martínez Barroso, P., Vaverková, M. D., Zumr, D., Jõgiste, K., Metslaid, M., Koster, K., Köster, E., Pumpanen, J., Ribeiro-Kumara, C., Di Prima, S., Pastor, A., Rumpel, C., Seeger, M., Daliakopoulos, I., Daskalakou, E., Koutroulis, A., Papadopoulou, M. P., Knicker, H. B., Lucas-Borja, M. E., Pausas, J., Prat-Guitart, N., Ubeda, X., Vilar, L., Destouni, G., Ghajarnia, N., Kalantari, Z., Seifollahi-Aghmiuni, S., Dindaroglu, T., Yakupoglu, T., Smith, T., Doerr, S., & Cerdà, A. (2021). Current wildland fire patterns and challenges in Europe: A synthesis of national perspectives. *Air, Soil and Water Research*, 14, 1–19. https://doi.org/10.1177/11786221211028185

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- Jo, H.-W., Krasovskiy, A., Hong, M., Corning, S., Kim, W., Kraxner, F., & Lee, W.-K. (2023). Modeling Historical and Future Forest Fires in South Korea: The FLAM Optimization Approach. *Remote Sensing*, 15(5), 1446. https://doi.org/10.3390/rs15051446
- Corning, S., Krasovskiy, A., Kiparisov, P., San Pedro, J., Viana, C.M., & Kraxner, F. (2024). Anticipating Future Risks of Climate-Driven Wildfires in Boreal Forests. *Fire*, 7(4), 144. https://doi.org/10.3390/fire7040144

Rodrigo Mahaluf is a Senior Scientist at the Complex Systems Engineering Institute (ISCI) and the General Manager of Fire Management and Advanced Analytics, ISCI's research team focused on wildfire management. He holds a degree in Industrial Engineering from the University of Chile and has extensive experience in developing analytical tools to support decision-making in wildfire risk management. He actively participates in the European FIRE-RES project, representing ISCI in efforts to enhance wildfire resilience through innovative technologies and methodologies. His research integrates simulation, optimization, and artificial intelligence to develop cutting-edge decision-support systems that help anticipate, prevent, and mitigate wildfire impacts. A key focus of his work is ensuring that state-of-the-art scientific research is effectively transferred into real-world applications. He collaborates closely with industries—such as electrical utilities—to improve risk assessment models, helping them reduce fire hazards associated with power infrastructure. He also works with forest agencies and emergency management organizations, providing them with advanced simulation and planning tools that enhance preparedness and response strategies. In addition to international collaborations, he has contributed to national research initiatives, including the FONDEF project "Diseño de paisajes resistentes a incendios forestales integrando modelos de simulación, optimización e inteligencia artificial", which aimed to design fire-resilient landscapes using advanced modeling techniques. Through his leadership, he strives to bridge the gap between cutting-edge research and operational decision-making, ensuring that scientific advancements translate into actionable solutions for fire-prone regions worldwide.

- Recommendations for improving security on WUI at multiplescales.
- González-Olabarria, J. R., Carrasco, J., Pais, C., García-Gonzalo, J., Palacios-Meneses, D., Mahaluf-Recasens, R., Porkhum, O., & Weintraub, A. (2023). A fire spread simulator to support tactical management decisions for Mediterranean landscapes. *Frontiers in*
- Pais, C., Miranda, A., Carrasco, J., & Shen, Z.-J. M. (2021). Deep fire topology: Understanding the role of landscape spatial patterns in wildfire occurrence using artificial intelligence. *Environmental Modelling & Software*, 143, 105122. https://doi.org/10.1016/j.envsoft.2021.105122

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Hussam Mahmoud is the George T. Abell Professor in Infrastructure in the Department of Civil and Environmental Engineering at Colorado State University. Dr. Mahmoud's research focuses on sustainable and resilient infrastructure and communities, emphasizing developing socio-physical models to capture the recovery of systems as influenced by human behavior and socio-economic policies. He is an international authority on infrastructure and community resilience and an advisor to the World Bank, the international Science Council, the United Nations, insurance companies, and other agencies on such topics. His recent work on predicting wildfire vulnerability to the built environment is set to provide a new paradigm for wildfire mitigation worldwide, and he has recently received significant funding from the Gordon and Betty Moore Foundation to support this effort. He has authored over 300 publications and given over 180 presentations, including 140 invited talks at national and international conferences and workshops, distinguished lectures, and keynotes. He has chaired and served on numerous technical committees, including the ASCE Committees on Fire Protection and Multi-hazard Mitigation. Dr. Mahmoud is a Fellow of the American Society of Civil Engineers, Fellow of the Structural Engineering Institute, and is the recipient of various awards. He has been invited to various symposia by the U.S. National Academies, the Royal Academy of Engineering, and the Royal Institute of International Affairs. His research has received media coverage through citations and interviews in numerous venues, including Nature Computational Science, Nature Climate Change, The U.S. National Academy of Engineering, Smithsonian Magazine, CNN, Forbes, and The New York Times.

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Eric Maillé, PhD, is a Research Engineer in the INRAE/Aix-Marseille University join research unit "Risks, ecosystems, Environment Resilience (RECOVER)" at Aix en Provence, France. He is specializing in global wildfire risk modeling at WUI, at local scale, by integrating both hazard and vulnerability components. His work notably involves developing WUI spatial analysis models aimed at relating spatial WUI structures, representing the intrication of fuel vegetation classes and vulnerable anthropogenic objects (buildings, infrastructures, etc.) to experienced impacting fire events. He also develops multi-criteria models and tools to assess physical and anthropogenic vulnerabilities in built-up areas and local territories at the forest-urban interface. His third research topic is to develop spatial models of WUI dynamic aimed at anticipating future change in fire risk, at local scale, in the context of climate change. He notably developed these research topics in several European Projects including FireParadox (2007-2010), FUME (2010-2013), MEDSTAR & INTERMED (2018-2022), and now MEDSTAR II (2025-2028). Dr. Maillé also has an important activity in transferring research results to decision-makers by providing valuable information for long-term planning in regions where urban development and natural landscapes converge, and by developing tools and web-services implementing the specified research models (WUIMAP II, VULNINTERMED, etc.). He will mainly present some works of Dr. Anne Ganteanme, Research Director in the same research unit, whose works focus on fire behaviour physical modelling at WUI, fuel vegetation fire traits assessment and fire ecology.

José M. Moreno is Emeritus Professor of Ecology at the University of Castilla-La Mancha and Fellow at the Royal Spanish Academy of Sciences. He is a terrestrial ecologist by training, and my interests are focused on understanding wildfire's effects on the ecosystem and landscape and the impacts of climate and global change on them. I have worked mainly on Mediterranean-type ecosystems.

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Elsa Pastor is a Full Professor in the Department of Chemical Engineering at the Universitat Politècnica de Catalunya (UPC). For over 20 years, she has been dedicated to advancing teaching and research in safety and risk analysis, with a particular focus on fire risk assessment in the wildland-urban interface (WUI). Dr. Pastor has led numerous projects across both the private and public sectors, developing innovative methodologies for WUI fire prevention, mitigation, and risk management. She has coordinated several European research projects funded by the European Commission's Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG-ECHO), including WUIVIEW (Wildland-Urban Interface VIrtual Essays Workbench, 2019 - 2021), WUITIPS (Wildland-Urban Interface Fire Tourist Infrastructure Protection Solutions, 2023-2025), and FIREPRIME (European Program for Wildfire-Prepared Communities, 2024-2026). She has authored 70 peer-reviewed articles in high-impact international journals and contributed to over 100 scientific conferences worldwide. Additionally, she has co-authored 10 specialized books and supervised 10 doctoral theses, playing a key role in shaping the next generation of researchers in fire risk analysis.

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Yannick Le Page is a wildfire knowledge and innovation expert at the Portuguese Integrated Fire Management Agency (AGIF) since 2020. The agency was created in the aftermath of the 2017 fire season and tasked to 1. develop a new national strategy to prevent devastating fires, and 2. coordinate its implementation. Yannick works to ensure that the strategy is driven by the best available science and knowledge. He is particularly involved in implementing risk assessments, developing interactive analytical tools to support informed decision making and communication campaigns, as well as identifying opportunities from innovation and through a lessons learned process applied to recent fire events. His scientific experience is grounded in a forestry PhD at the University of Lisbon, and 10+ years of research. This includes a scientist position at the Joint Global Change Research Institute (Washington DC, U.S.A.) which provides future societal scenarios to the IPCC. Yannick was involved in a range of multi-disciplinary projects, with a core focus on improving the representation of vegetation dynamics in the model and exploring their interaction with societal, economic, and policy decisions. He also developed the Human-Earth System Fire model (HESFIRE) to evaluate future fire regimes under changing environmental and socio-economic conditions.

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Dr. Eulàlia Planas is a Professor in the Department of Chemical Engineering at the Universitat Politècnica de Catalunya (UPC) and the Head of the Centre for Technological Risk Studies (CERTEC). She holds a degree in Industrial Engineering (1993) and a PhD in Chemical Engineering (1996). Her main research areas include the study of hydrocarbon pool fires, the mathematical modeling of major accidents, risk analysis related to the transportation of hazardous materials, and the assessment of natural hazards impacting industrial facilities (NaTech), with a particular focus on wildfires. In wildfire research, Dr. Planas has developed infrared image processing systems to quantify fire progression metrics such as rate of spread, fire intensity, and flame geometry, as well as to evaluate the effectiveness of aerial fire suppression. She is also advancing systems to deliver fire behavior forecasts for decision-making purposes, leveraging data assimilation and inverse modeling techniques. Her work in wildland-urban interface (WUI) fires focuses on developing methodologies using CFD modeling to study the effects of burning wildland and residential fuels on structures. These studies incorporate performance-based criteria to evaluate house vulnerability and sheltering capacity. Dr. Planas is extensively involved in experimental fire research, further enriching her contributions to the field.

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Michele Salis, PhD in Agrometeorology and Ecophysiology of Agricultural and Forestry Systems (2008) at the University of Sassari. From 2008 to 2018, post-doc, research assistant and researcher at University of Sassari, Euro-Mediterranean Center on Climate Change, and National Research Council of Italy. Visiting Researcher at the USDA Forest Service in 2010. In 2018 he became Permanent Research Scientist, and then Senior Research Scientist (2020) at the National Research Council. In 2023, he obtained the National Academic Qualifications as Full Professor and as Associate Professor on Science and Technology of Wooded and Forest Ecosystems (07/B2). His main research fields focus on: a) fire spread and behavior modeling; b) fire hazard, exposure and risk evaluation; c) fire management strategies. He has been and is currently involved in several European, National, and regional research projects as scientific coordinator, local team coordinator and researcher; in these projects, he also was/is Module or Task leader. He was and is also member of the Advisory Board of some projects, and served as scientific expert for the evaluation of competitive research projects in EU and North America. Lecturer and invited speaker at various national and international courses on wildfires. He participated as speaker or invited speaker, and as Member of Scientific and Organizing Committees, at many scientific conferences in Italy and abroad. Tutor or co-tutor of PhD and Master students in Italy and Spain, and scientific supervisor of several post-doc, PhD, Master and foreign students at the University of Sassari and the National Research Council. Author and co-author of several scientific articles, book chapters and technical reports, he has the following indicators of scientific productivity (SCOPUS, February 2025): 48 indexed works, h-index 22, 1480 citations.

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J. San-Miguel-Ayanz works at the European Commission Joint Research Centre and is in charge of the development and operation of the European Forest Fire Information System (EFFIS) and the Global Wildfire Information System (GWIS). Currently, he leads the development of an AI-based Global Wildfire Decision Support System, in collaboration with EU and USA experts. He holds a PhD (1993) and a MSc (1989) in Wildland Information Science, with majors on Remote Sensing and Geographic Information Systems by the University of California-Berkeley, Berkeley, California, U.S.A., and a Forest Engineering Degree (1987) by Polytechnic University, Madrid, Spain. J. San-Miguel-Ayanz is co-chair of the Expert Group on Forest Fires in the pan-European region (EGFF - 43 countries) and the Expert Group on Forest Fires of Latin America and the Caribbean (EGFF LAC). Additionally, he acts as co-chair of the Global Observation of Forest Cover Fire Implementation Team (GOFC Fire IT) and leads the Group on Earth Observation (GEO) GWIS initiative. Publication list available at: https://scholar.google.it/citations?hl=en&user=I6t-LYgAAAAJ&view_op=list_works&sortby=pubdate

Jason Sharples is a mathematical scientist at the University of New South Wales (UNSW), Professor of Bushfire Dynamics and Director of UNSW Bushfire. As an internationally recognised expert in dynamic wildfire behaviour and extreme wildfire development, his research has extensively influenced policy and practice in Australia and internationally. He uses advanced mathematical and computational models to understand the dynamics of wildfire propagation and to pinpoint geographic features and weather conditions more likely to generate extreme wildfires. He is Operations Node Leader in the NSW Bushfire and Natural Hazards Research Centre and is further involved in various national and international research projects. He is a regular contributor to international wildfire science and professional dialogue. Jason has been elected a Fellow of the Australian Academy of Technological Sciences and Engineering, and the Royal Society of New South Wales. He also has a background working as a firefighter

with the ACT Rural Fire Service and providing operational support and expert advice to the NSW Rural Fire Service, the NSW Coroners Court, and the Royal Commission into Natural Disasters in Australia.

María Olga Viedma Sillero is a geographer with a Ph.D. in Environmental Sciences, specializing in Remote Sensing and Geographic Information Systems (GIS). I am a member of the "Fire Ecology and Other Disturbances in the Context of Global Change" (GLOBECO) research group at the Faculty of Environmental Sciences and Biochemistry, University of Castilla-La Mancha (UCLM). Currently, I work as an assistant professor at UCLM, where my primary research focuses on Landscape Ecology and Forest Fires. My work has been centered on: i) developing new methodologies for fire mapping using satellite imagery; ii) analyzing spatio-temporal patterns of forest fires and fire hazard assessment; and iii) studying fire severity and post-fire regeneration through satellite and LiDAR data. Additionally, I serve as the Coordinator of the Official Master's degree in “Environmental Sustainability in Local and Territorial Development”, offered by the Faculty of Environmental Sciences and Biochemistry at UCLM.

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Andres Valencia is a Senior Lecturer at the University of Canterbury, Department of Civil and Natural Resources Engineering, and current director of the fire engineering postgraduate program. His research focuses on numerical and experimental studies of wildfires and aims to develop new engineering principles for reducing wildfire risk, particularly in urban areas, to build more fire-resilient communities. Current research includes investigating the potential harm of wildfires in the Wildland-Urban Interface (WUI) in New Zealand as part of the ongoing MBIE Endeavour Research Project "Extreme Fire Behaviour: Are we ready?" and the EU Horizon Project "Minority Report." These projects involve field, laboratory, and numerical experiments on New Zealand vegetation and its impact on urban settlements. Andres Valencia also consults on various wildfire risk projects and is currently developing a series of modular training courses specifically designed for U.S. emergency services personnel to enhance their understanding and response capabilities to WUI fires. Previously, he served as a wildfire scientist at Urban Intelligence (NZ).

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Craig Weinschenk is a director of research with the Fire Safety Research Institute (FSRI), part of UL Research Institutes. He holds a Master of Science and a doctorate in mechanical engineering from The University of Texas-Austin. During his graduate studies, Craig worked with the Austin Fire Department on analyzing firefighter compliance to changes in standard operating guidelines and on characterizing the impact of forced ventilation on room-scale fires. Since joining FSRI, he has conducted full-scale residential fire experiments designed to characterize the thermal environment within the structure as well as exposed firefighter personal protective equipment. Craig is also a developer of NIST's Fire Dynamics Simulator (FDS) Version 6. He has used FDS to study the fire dynamics and thermal environment of fires that resulted in line-of-duty deaths and injuries to firefighters. Craig currently the principal investigator for the development of the National Emergency Response Information System (NERIS).

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