

Continuing
Education
Program

Certificate of Advanced Studies specializing in forest Fires, Risk and Management



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École Pratique
des Hautes Études







Overview of Fire courses and weekly schedules

Module	Course, practices and field visits	Location	Dates
1	From particle to pyro geography : understanding of vegetation fire phenomena	University of Montpellier (South of France)	4 – 15 Nov. 2024 (2 weeks)
2	From risk forecasting to fire prevention	University of Montpellier (South of France)	18 Nov. – 6 Dec. 2024 (3 weeks)
3	Integrated fire management : fighting means, restoration, development (part I)	Valabre, National Forest Fires Education & Research Centre (South- East of France)	9 - 13 Dec 2024 (1 week)
4	Integrated fire management : fighting means, restoration, development (part II)	Salles, Regional Forest Fires Education Centre (South-West of France)	16 – 20 Dec 2024 (1 week)

Tuition fees (students can register for one or several modules)

1 000 € / week (1 student) or 900 € / week (more than 1 student registered)

5600 € for the 4 modules

Tailor-made courses in English by academics and practitioners from several countries
Courses covering all vegetation and forest types
Participants from international fire & forestry agencies

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Module Fire level 1

From particle to pyrogeography - understanding of vegetation fire phenomena

(4 – 15 Nov. , two weeks)

This course presents the basic concepts and methods for studying past and present fire regimes in the world in relation to global change.

The physical chemistry and ecology of fire will be taught by integrating all spatial scales from the twig to the regional scale. The objectives are to understand the components that define a fire regime as well as the study methods to characterize ecosystems and their past and present fire regimes. The diversity of ecosystems as well as their functioning and responses to fire will be studied. Tutorials will be based on the most widely used models in the world to explore the links between ecosystems, fires and global changes, as well as on the analysis and

exploitation of data, especially spatial data. The impacts of past and present fire regimes will initiate the general reflection common to the fire Modules targeting the integrated management of fires with the aim of sustainable development of ecosystems by societies increasingly exposed to fire risk.

Speakers : L. BREMOND (EPHE), B. BROSSIER (CNRS), J-L. DUPUY (INRRAE), C. HELY (EPHE), F. MOUILLOT (IRD), R. PRODON (emerita EPHE), R. DEHERBECOURT (MTDA)

Location of this 60h Module (2 weeks): on University of Montpellier campus (Triolet)



Forest Fires, Risk and management – Level 1: Week 1/2

Courses located at the University of Montpellier

4/11/2024 to 8/11/2024	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 am 12:00 pm	HELY : <i>Introduction PART 1: Combustion process; Environmental drivers ; Fire regime concept ; fire behaviour and models (FBP and BehavePlus)</i>	DUPUY: <i>Introduction PART 2: Basic fire processes Fire behaviour Fire behaviour model overview</i>	MOUILLOT: <i>Fire observations : Census data</i>	MOUILLOT: <i>Fire observations : remote sensing data</i>	MOUILLOT, HELY: <i>Suite exercise Remote sensing (Fire Atlas)</i>
02:00 pm 05:00 pm	HELY : <i>Exercises with BehavePlus to test the effects of different factors on fire behavior and tree mortality (DBH, crown basis, bark thickness) FlamMap</i>	MOUILLOT: <i>Plant functional traits and fire : pyro- ecophysiology + back to BehavePlus exercise on tree mortality</i>	MOUILLOT + HELY: <i>Fire databases (USA, Canada, and Promethée) Homework</i>	MOUILLOT + HELY: <i>Remote sen- sing databases (EFFIS, MODIS, VIIRS, GABAMS</i>	Weekly evaluation: <i>worldwide examples Based on analysis of scientific papers</i>

Forest Fires, Risk and management – Level 1: Week 2/2

Courses at the University of Montpellier

11/11/2024 to 15/11/2024	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 am 12:00 pm	BROSSIER + HELY: <i>Fires History- dendrochronology: Field visits, 1989 and 2010 Montaud fires, landscape analysis with sampling</i>	BREMOND + HELY: <i>Fires History with microcarbon analysis Field visit – Salagou fire</i>	HELY: <i>Fire weather hazard indexes From theory to application using R</i>	PRODON + HELY: <i>Fire and Animals diversity</i>	Remi DHERBE- COURT: <i>Gouvernance in forest fire mana- gement</i>
02:00 pm 05:00 pm	BROSSIER + HELY: <i>Fires History- den- drochronology: Sampling analysis, Experiments in Labs</i>	BREMOND: TP <i>Fires History with microcar- bon analysis Experiments in Lab with data analysis</i>	(HELY)+ SWAP (NASA): <i>Fire emissions, GFED, GFAS</i>	<i>Fire's impacts on biodiversity</i>	HELY: <i>weekly Evaluation</i>

Module Fire level 2

From risk forecasting to fire prevention

(18 Nov. - 6 Dec., three weeks)

This course focuses on the characterization of the different forcings of fire initiation and spread and addresses their management in order to reduce the vulnerability of ecosystems and societies.

Fire hazard monitoring and forecasting systems, whether meteorological, anthropogenic or structural due to land use, will be presented through different ecosystems in the world. The activities will be based on the presentation and use of more complex modeling tools than those presented in the first course. The objective of this course is to present in a theoretical way the chain of information necessary for the management of ecosystems and fire outbreaks prior to fire fighting. Particular attention will be paid to extreme fires in order to understand how they occur, why their frequency is increasing in the world and what the consequences are for societies. The teaching will also aim at presenting the different modalities of

prevention and protection against fires, whether it is through fuel management, urban planning and construction, fire use, community involvement, or regulation. The impacts of fire on air quality and health, on soils, waters and biodiversity will be presented to raise awareness of the need for a comprehensive approach to the issues of wildland fire.

Prerequisite : Module Fire level 1

Speakers : I. ANNESI-MAESAN (INSERM), R. BARBERO (INRAE), I. BELLONI SCHMIDT (University of Brasilia, Brasil), M. CASTELLNOU (University of Lleida, Spain), R. CINOTTI (Meteo France), F. GIROUD (CEREN), C. HELY (EPHE), S. LAHAYE (ClusterSAFE), B.H. SAHARJO (University of IPB, Indonesia), Ana MIRANDA (University of Aveiro, Portugal), B. REYMOND (ONF), E. RIGOLOT (INRAE)

Location of this 60h Module (3 weeks): on University of Montpellier campus



Forest Fires, Risk and management – Level 2: Week 1/2

Courses at the University of Montpellier

18/11/2024 to 22/11/2024	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 am 12:00 pm	LAHAYE & SAHARJO: <i>International networks and initiatives on forest fires (GWFN, ASEAN Initiative for FFM, NET-PEAT) European level Informal networks French network on Prescribed burns</i>	RIGOLLOT: <i>Methods and approaches to create and manage fire and fuel breaks (DFCI, prescribed burning, pastoralism)</i>	SAHARJO: <i>Strengthening regional network on minimizing Haze problem ; GHG emissions from Indonesian peatland fires</i>	SYAUFINA: <i>Peatland fires in Indonesia – Part 1: Peatlands Part 2: Fires causes & impacts Part 3: Fire management, from suppression to prevention</i>	BAREBRO, MOUILLOT, HELY: <i>Projects on megafire study cases (continued)</i>
02:00 pm 05:00 pm	FILIPPI: <i>Mesoscale fire risk modeling with the «Meso NH forest Fire» model</i>	REYMOND: <i>Pre- and post-fire approaches in France : Spatialization of forest areas and fuels, restoration of burned areas</i>	ANNESI-MAESAN: <i>Smoke & haze impacts on health</i> LEONELI: <i>Fire potential toxicity for operational teams; biomarkers</i>	HELY : <i>fuel sampling methodologies</i> BAREBRO,-MOUILLOT, HELY: <i>Projects on megafire study cases, using all available information including satellite images</i>	BAREBRO, MOUILLOT, HELY: <i>Projects on megafire study cases (end), exam</i>

Forest Fires, Risk and management – Level 1+2 wrap up Week at the University of Montpellier

25/11/2024 to 29/11/2024	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 am 12:00 pm	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>
02:00 pm 05:00 pm	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>	<i>Preparing this week's programme</i> <i>Synthesis and tabletop exercises</i> Or <i>Field trip and facilities' visit in Marseille région</i>

Forest Fires, Risk and management – Level 2: Week 2/2

Courses at the University of Montpellier

2/12/2024 to 6/12/2024	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 am	SHARPLES: Online from Australia <i>Australian fires and populations</i>	UYTTEWAAL Online from New-Zealand <i>Community based fire management</i>	<u>Field visit:</u> National AIR BASE	CASTELLNOU & LAHAYE: <i>extreme fire events: definition, drivers, behavior, impacts</i>	scheduling in progress
12:00 pm	SAHARJO: Online from Indonesia <i>Sustainable forest management : is it mission impossible ?</i>	SAHARJO : Online from Indonesia <i>Use of fire by communities in the Mediterranean region and in Indonesia</i>	<i>Presentation and use of air assets, such as scoopers, fixed wings, UAVs</i>		
02:00 pm	GIROUD: <i>chemical retardants</i>				
05:00 pm	HELY: <i>Flammap6 model for landscape fire analysis</i> <i>Ecosystem dynamics, fires, forest : lessons from the past for sustainable forest management in Canadian boreal forest</i>	SCHMIDT: (online from Brazil) <i>fire use in Brazilian cerrados and consequences on the emissions budget and burned areas</i>	<u>Field visit:</u> National AIR BASE <i>Aerial coordination; aerial surveillance by plane and UAVs</i>	<u>Field visit:</u> <i>Fire brigade presentation and demo of ground means</i>	scheduling in progress



Module Fire level 3

Integrated fire management: fighting means, restoration, development

(9 - 13 Dec., one week)

This course is based on the French operational method of fire management from the preparation and fight to stop a fire (short term) to the restoration of ecosystems and their management (medium and long terms).

The French firefighting strategy will be presented and compared to other international strategies. The objective of this course is to prepare for a firefight and the restoration and development to be carried out following the fire. The aim is to learn how to prepare a response to fires, by developing a fire fighting strategy in cooperation with all the public services involved in firefighting. The analysis and decision-making tools will be presented, including environmental indicators (topography, structures, landscapes, ecosystems), and issues and vulnerability. The different intervention strategies, on fire outbreaks or established fires and according to the contexts, taking into

account different international cultures, will be developed and worked on in tutorials. The means of the French civil security will be presented and work on a training simulator and on images and data of past fires will allow analyzing the success factors in the fight. Site visits, in particular to the civil security air base in Nîmes, schools and operational coordination and decision-making centers, will illustrate the theoretical lessons. The teaching of ecosystem restoration and development techniques will include fuel management.

Prerequisites : Module Fire levels 1 and 2

Speakers : the members of the Civil Protection and of the ENTENTE in Valabre

Location of this 30h Module (1 week) : at Valabre Center near Aix-en-Provence. Accommodation booking near Valabre will be facilitated



Forest Fires, Risk and management – Level 3: Week 1/1

Courses at Valabre (near Aix-en-Provence)

09/12/2024 to 13/12/2024	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 am	CHASSAGNE: <i>Fire suppression strategy and doctrine</i>	GIROUD: <i>Prevention by land management</i>	FAURE + JOSEPH: <i>Practical study #1:</i>	CEREN: <i>Fire behaviour experiment</i>	
12:00 pm	MICHELIS: <i>Ground and aerial fire suppression means</i>	JONES: <i>Data collection, intelligence Command System</i> <i>Interagency coordination</i>	<i>Lessons learned from a recent large scale fire</i>	FARCY: <i>Practical study #3:</i> <i>Lessons learned from a recent large scale fire</i>	<u>Field Visit:</u> <i>Regional command centre</i>
02:00 pm	JONES: <i>Fire suppression tactics</i>	<i>Integrated fire management framework</i>	<i>Practical study #2:</i> <i>Lessons learned from a recent large scale fire</i>	<i>Practical study #4:</i> <i>Lessons learned from a recent large scale fire</i>	HELY: <i>Evaluation</i>
05:00 pm		<i>Training & education framework</i>			<i>Forest fires analysis</i>



Module Fire level 4

Integrated fire management: control, restoration, development (field week)

(16 – 20 Dec., one week)

This is a practical course based on a field trip beyond the Mediterranean area, with visits to the Gascony region over several days.

The local actors of the Civil Protection and the territorial managers (in particular private foresters) will present the actions carried out all along the chain of information necessary to an effective integrated management of the fires. Tutorial work will allow students to analyze the risks, prevention methods and to develop fire fighting strategies through management plan building. Only students who have taken the course Fire levels 1 to 3 will be able to enroll in this module. Transport from Aix-en-Provence to Bordeaux on Sunday is included in the programme and accommodation booking near Salles will be facilitated.

Prerequisites : Module Fire levels 1, 2 and 3

Speakers : C. HELY, members of the Civil Protection in the visited departments as well as members of the National Forestry Service (ONF) and the National Center of Private Forests (CNPF) of Gascony

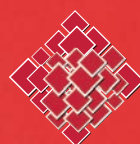
Location of this 30h Module (1 week) : We will use classrooms of the SDIS 33 Firefighting school in Salles and we will visit different forests that we will relate to their fire risk management and plan.



Forest Fires, Risk and management – Level 4: Week 1/1 :
Landes de Gascogne Region : Private production forests, fire risk and management

16/12/2024 to 20/12/2024	Monday	Tuesday	Wednesday	Thursday	Friday
<div>09:00 am</div> <div>12:00 pm</div>	<div>Forest fire prevention : Landes forestry practices</div>	<div>Forest fire prevention : Landes forestry practices</div>	<div>Fire danger rating system</div> <div>Fire weather forecast adjustments</div>	<div>Fire prevention : land and forest management</div>	<div>Weekly evaluation</div>
<div>02:00 pm</div> <div>05:00 pm</div>	<div>Forest fire prevention : Landes forestry practices</div>	<div>Forest fire prevention : Landes forestry practices</div>	<div>Field visit: Watch towers, fire suppression technics</div>	<div>Fire suppression technics</div>	<div>Visit to the fire service headquarters in Bordeaux</div>





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