

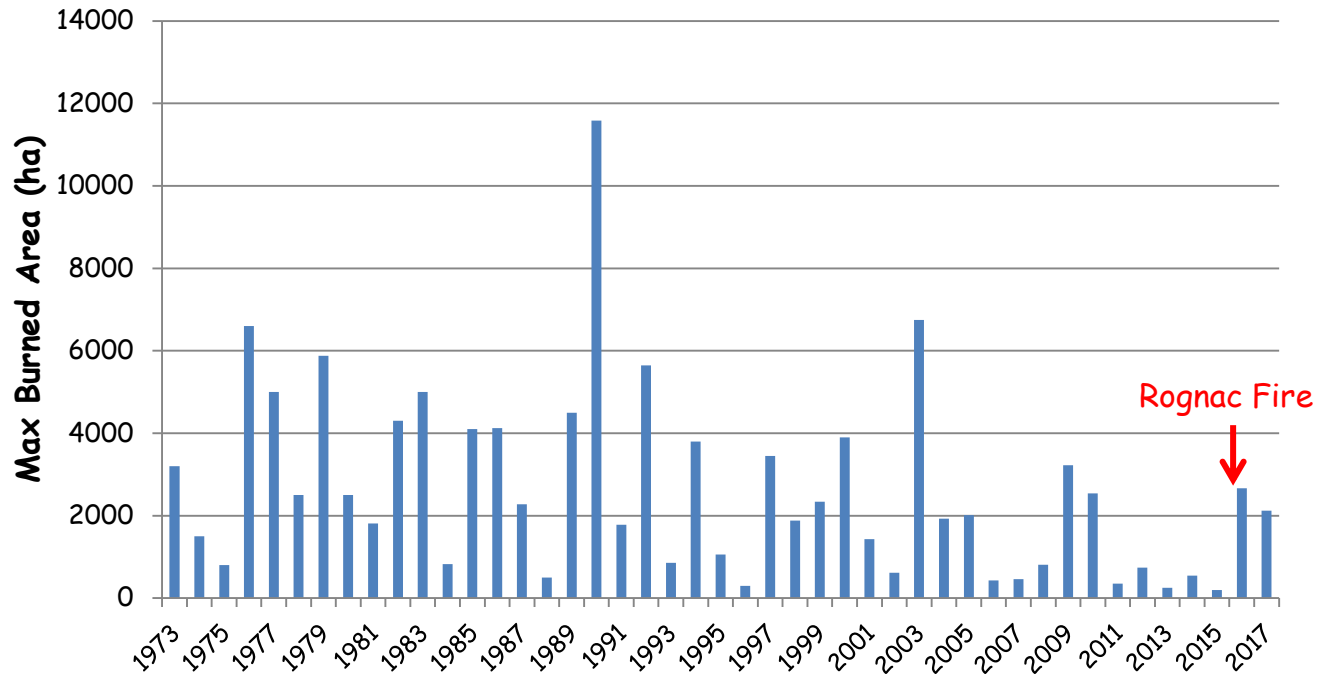
# Role of the ornamental vegetation in the propagation of the Rognac fire (SE France, 2016)

Anne Ganteaume



# Introduction

## SE France: largest fire size/year



# Introduction



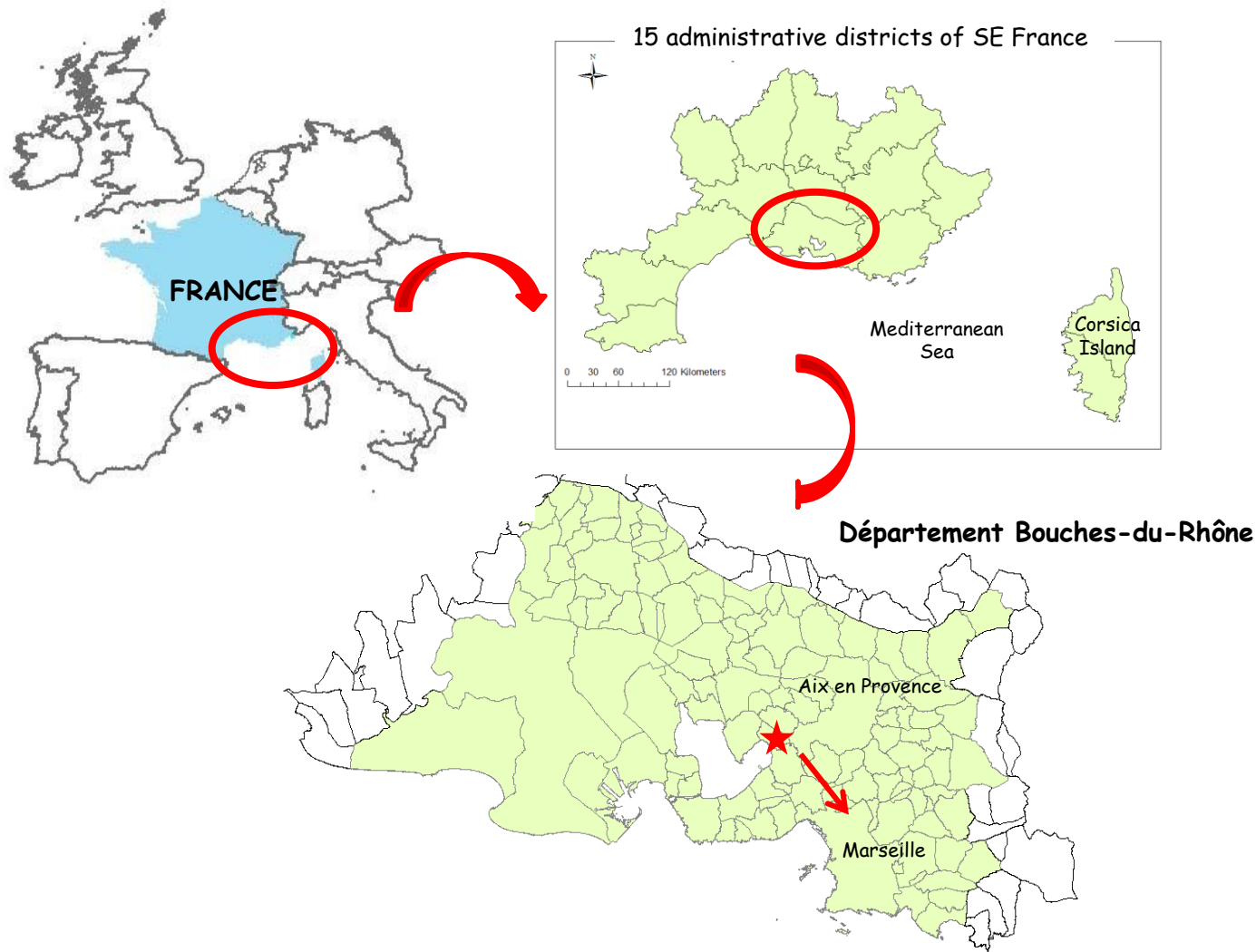
**Ignition in Rognac August 10, 2016 at 3:09pm**

**Cause: Negligence during private works**

**1932 structures to be defended against fire**

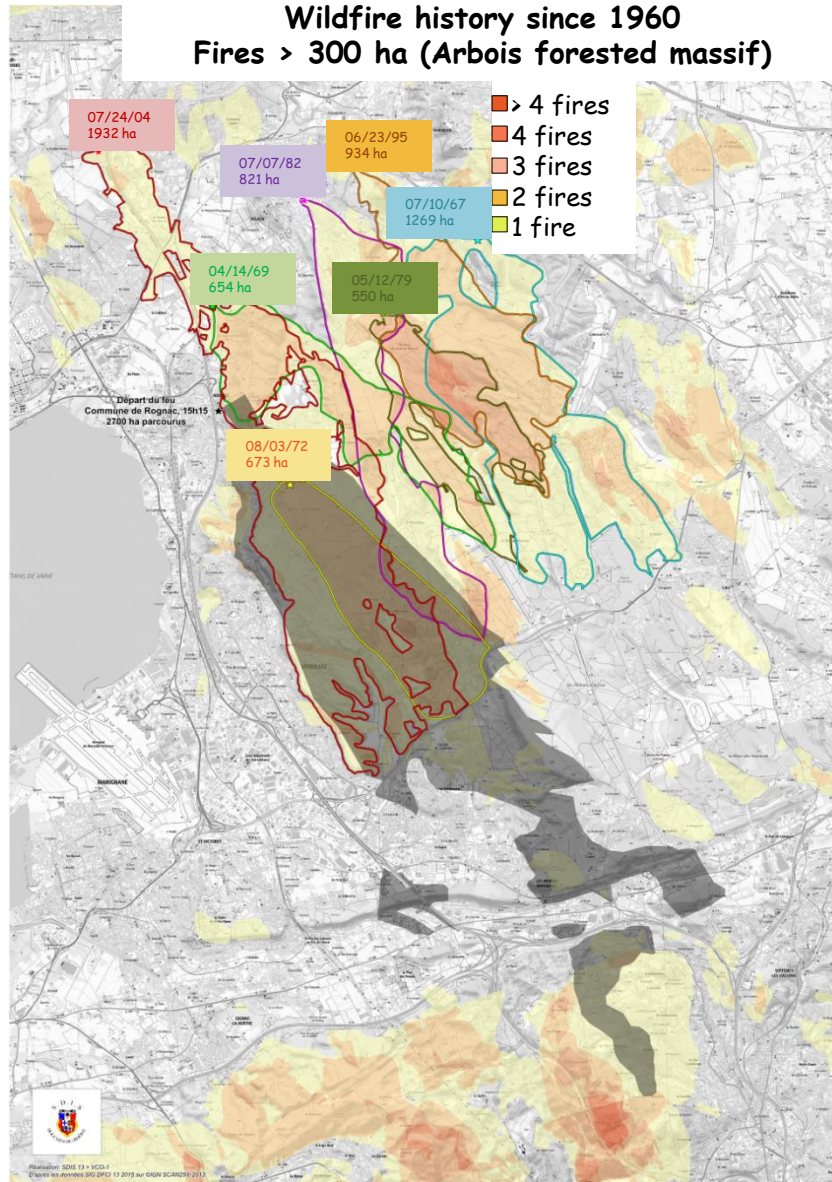
**2663 ha burned mostly in WUI (2032 ha in WUI & urban areas)**

# Location

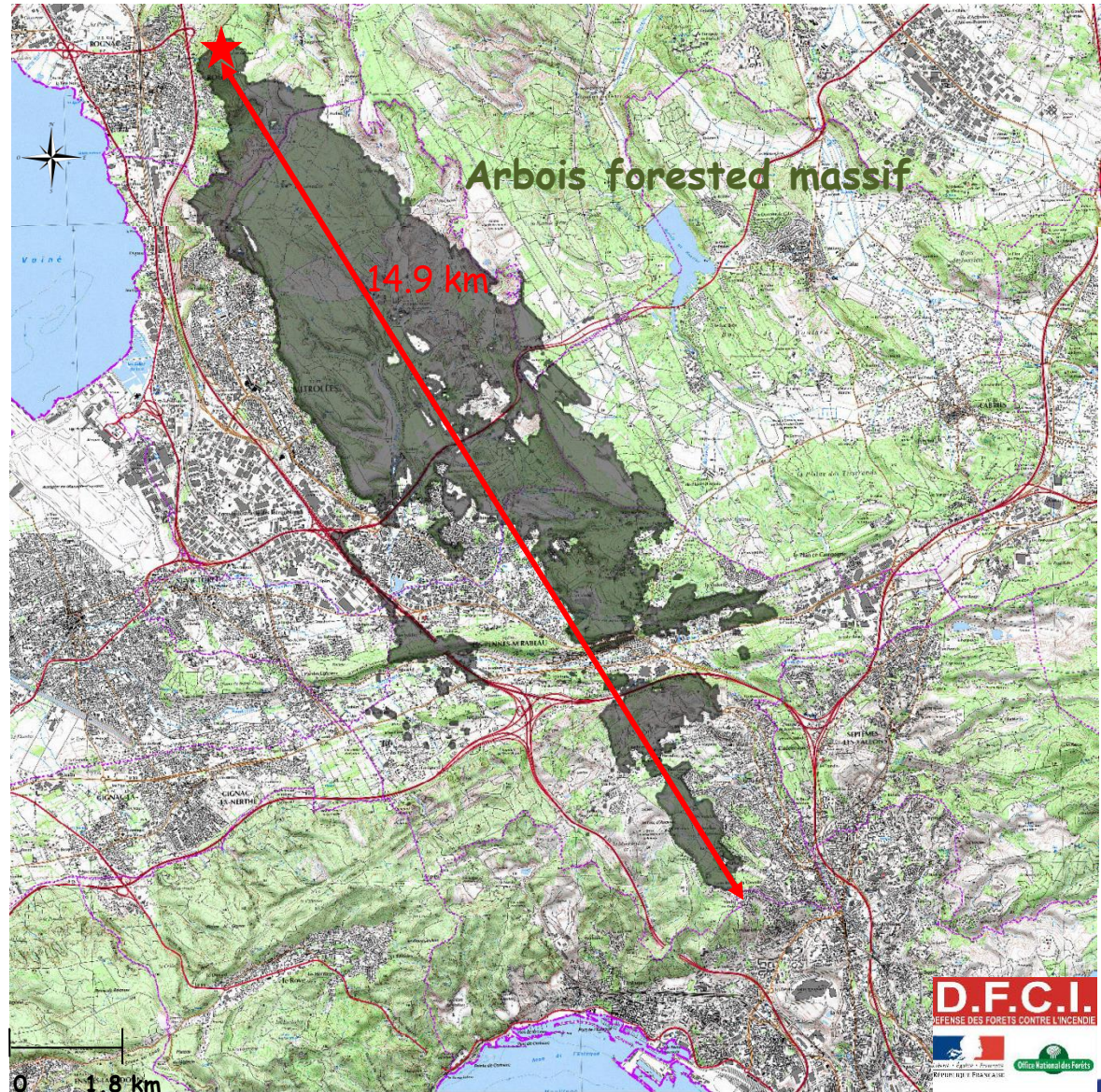
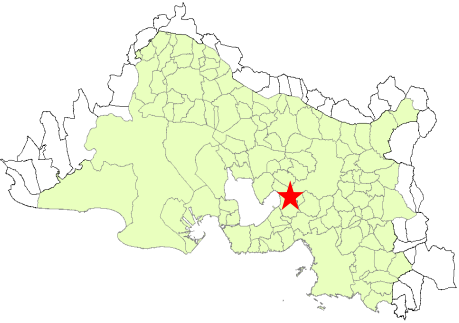


# Location

Area already highly impacted by large fires since 1967



# Location



## 7 Communities affected :

- Vitrolles (1648 ha),
- Les Pennes-Mirabeau (676 ha),
- Rognac (166 ha),
- Cabriès (140 ha),
- Aix-En-Provence (30 ha),
- Saint-Victoret (3 ha),
- Marseille (0.5 ha)

Mean ROS= 5.3 kmh<sup>-1</sup>

# The context

## A limited firefighting force

- Most firefighting aircraft grounded due to unexpected maintenance
- Other on-going fires the same day:

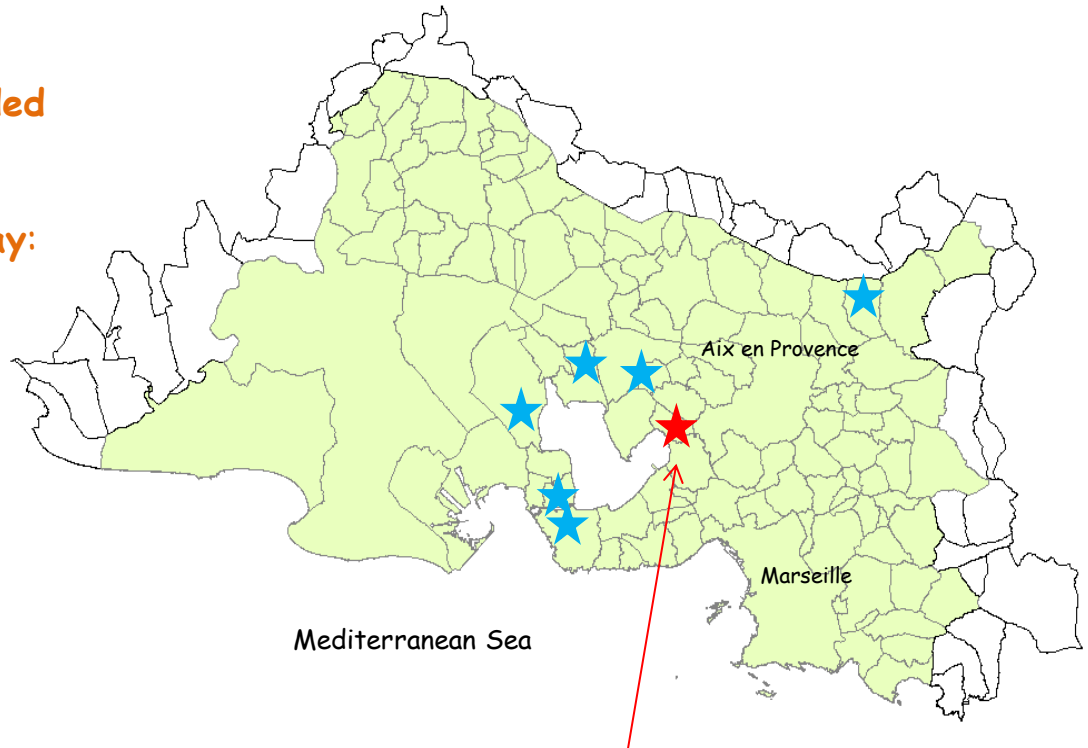
- 8 in Bouches-du-Rhône:

MARTIGUES 11H29 3 ha  
FOS SUR MER 11H56 1018 ha  
JOUQUES 15H05 0,5 ha  
ROGNAC 15H09 2655 ha  
ISTRES 17H58 29,3 ha  
LAMBESC 18H32 0,1 ha  
COUDOUX 18H45 0,4 ha  
MARTIGUES 23H27 0,1 ha

- 2 in Hérault (a nearby département)

ROQUESSELS (34) 14H0 196 ha  
ST PONS DE MAUCHIENS (34) 16h50 29 ha

- FUNCHAL, Madeira Island (Portugal)



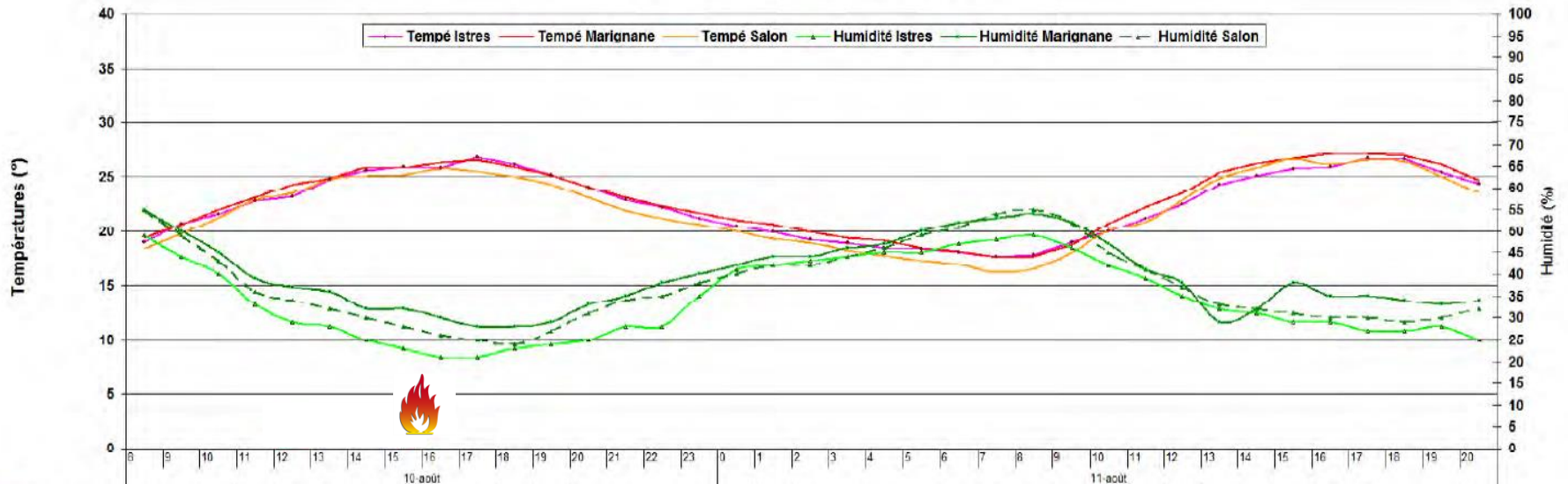
# firefighting land and aerial vehicles : 560  
# firefighters: 1790



**Massive early attack failed**

# The context

## Severe climate conditions



Evolution of temperature and relative humidity during August 10 and 11, 2016 in the fire ignition zone

- FWI: Exceptional
- Mean relative humidity: 25%

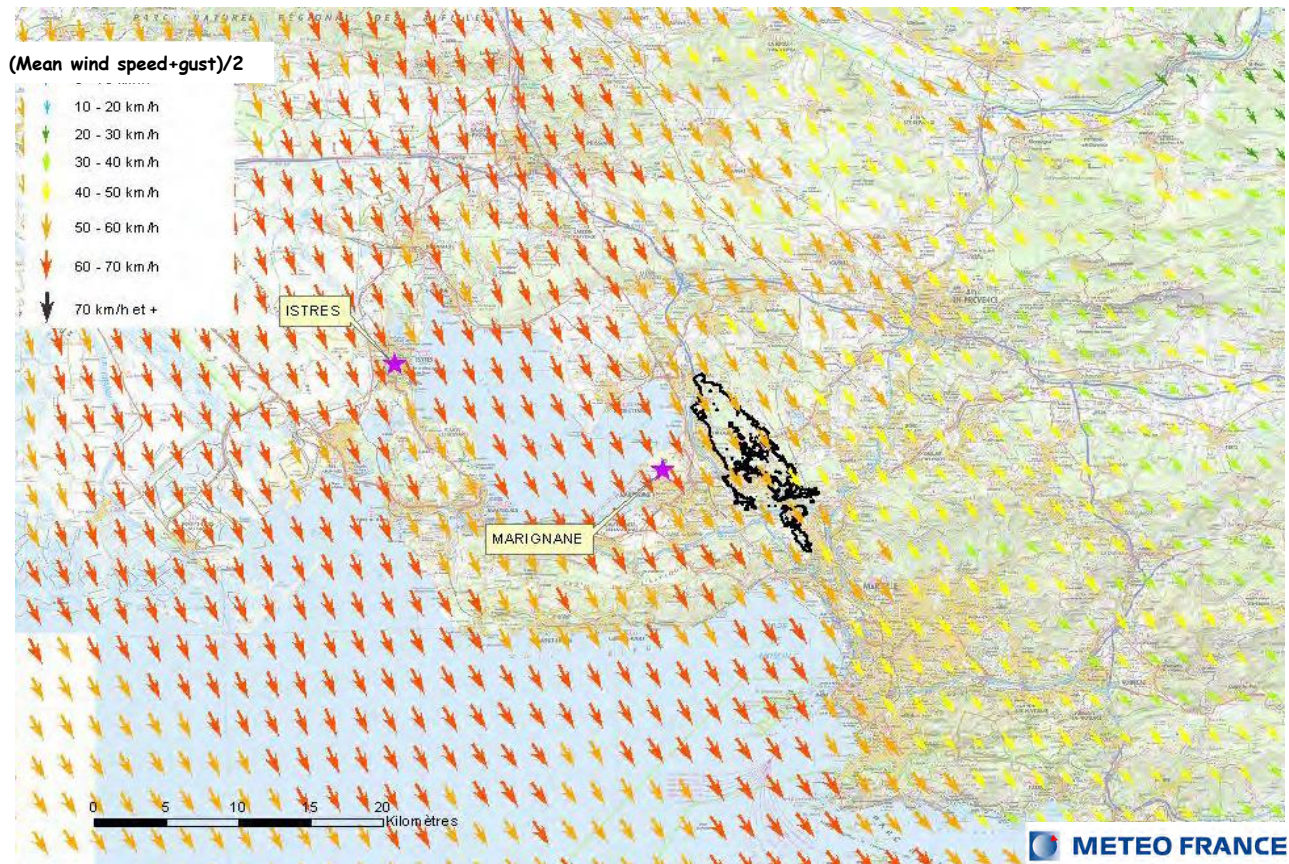


# The context

## Severe climate conditions

➤ Strong wind in the area

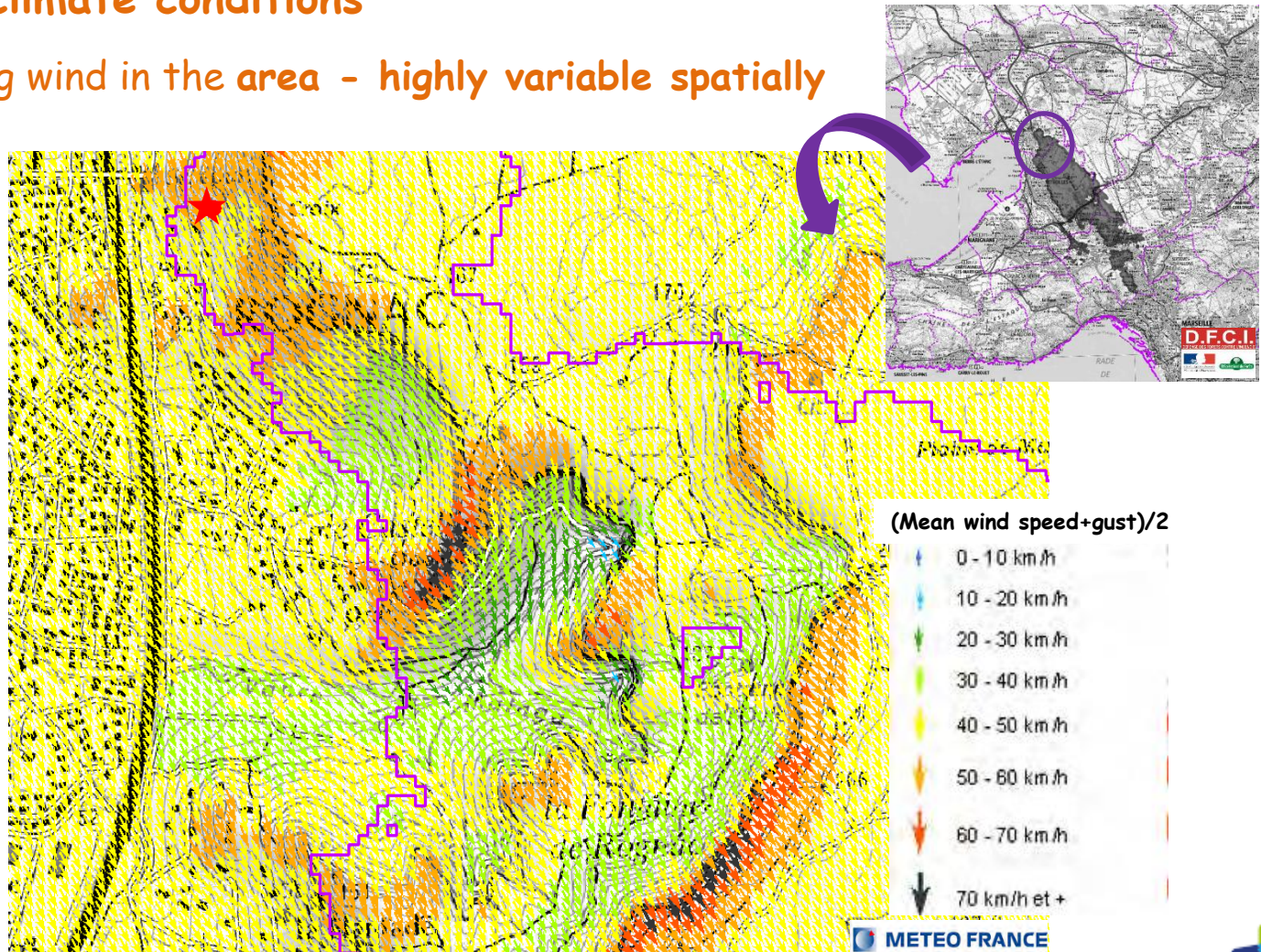
Wind speed: 55 km/h, gusts at 85 km/h



# The context

## Severe climate conditions

- Strong wind in the area - highly variable spatially



# The context

High proportion of WUI - in constant increase

➤ Higher population density

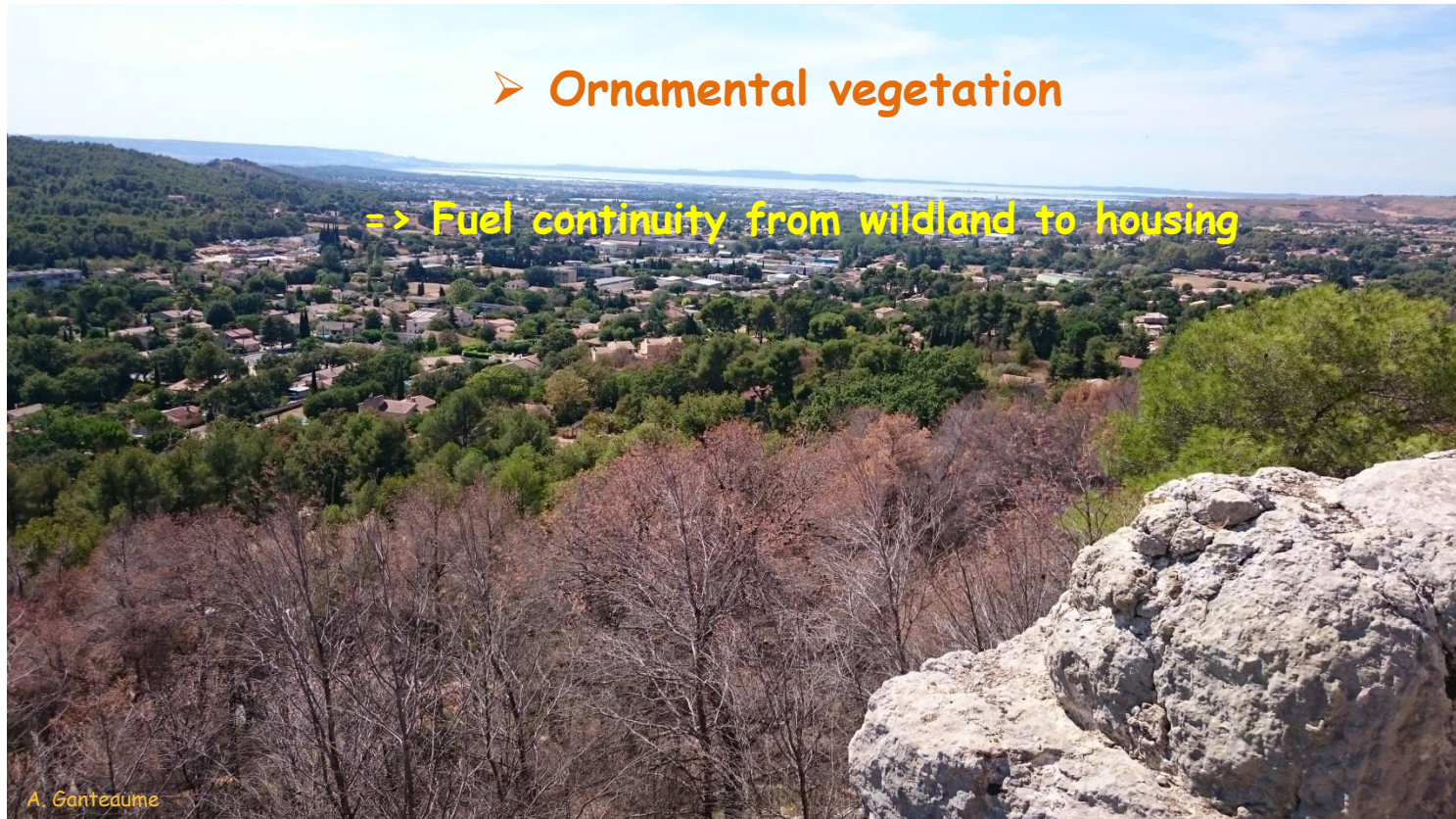
WUI = High fire risk

15% area of Bouches-du-Rhône => 47% fire ignitions,  
mostly human caused (>95%)

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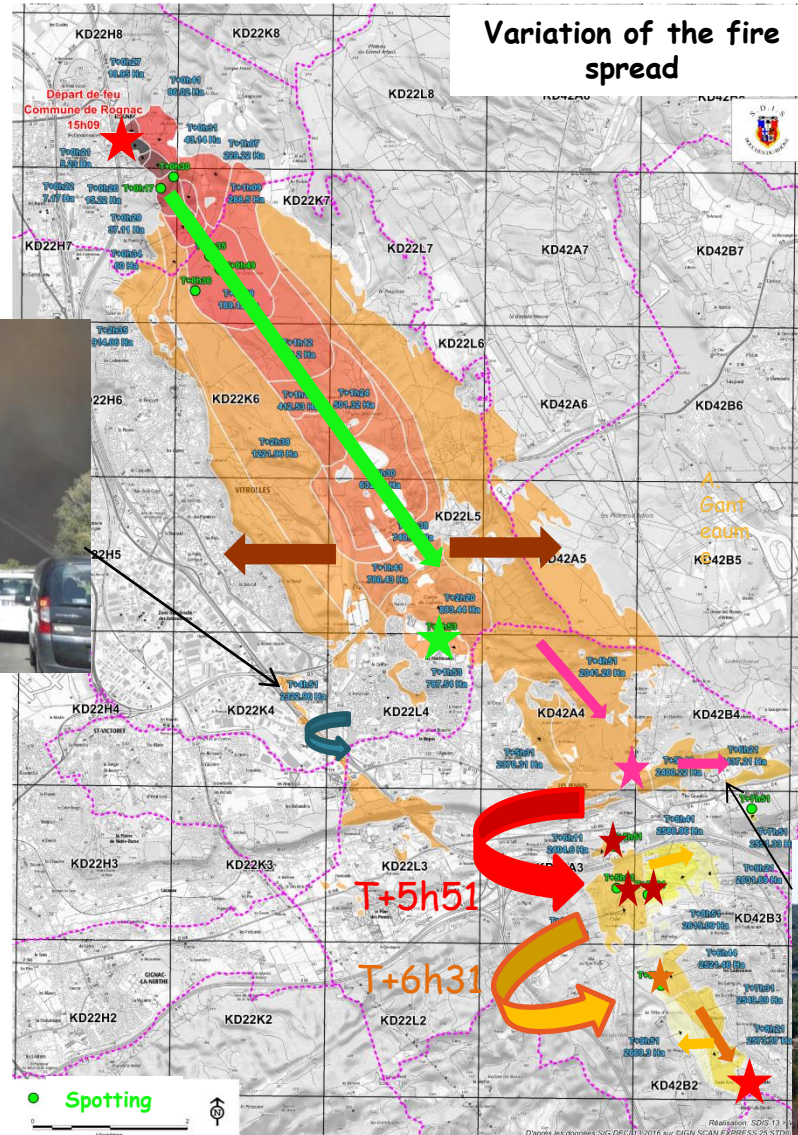
# The context

High proportion of WUI - in constant increase



# What happened

★ Ignition in Rognac at T: 3:09pm



T+1h53  
787.54 ha

T+2h38  
1221.96 ha

T+4h51  
2223.96 ha

T+5h41  
2400.22 ha

T+6h31  
2501.58 ha

T+6h44  
2521.46 ha

T+8h21  
2573.57 ha

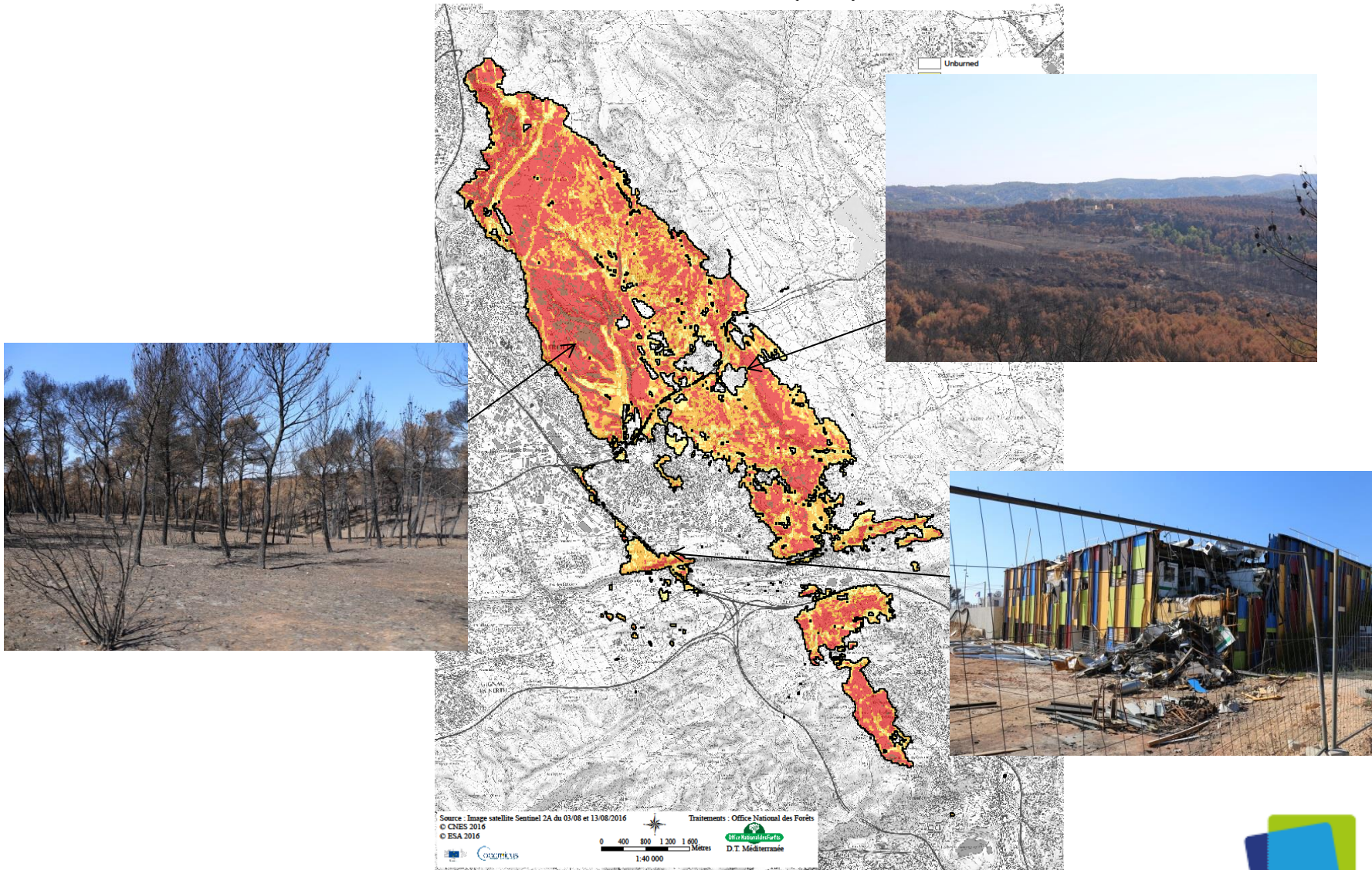
T+9h21  
2631.69 ha

T+9h51 in Marseille  
2669.3 ha

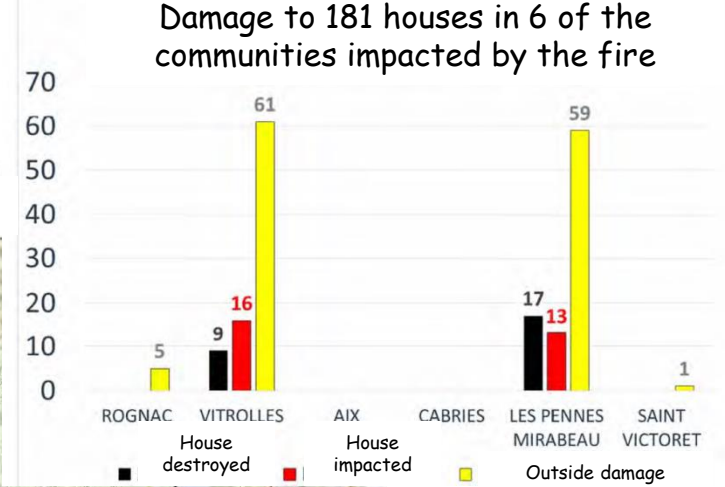


# What happened

## Fire severity according to the Normalized Burn Ratio (NBR)



# What happened



# What happened

Different types of damage:

➤ Outside damage





# What happened

Different types of damage:

- Houses impacted



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# What happened

Different types of damage:

- Houses destroyed



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# What happened

Role of ornamental hedges in the fire propagation



From the WUI...

# What happened

## Role of ornamental hedges in the fire propagation



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From the WUI...



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# What happened From the WUI...

## Role of ornamental hedges in the fire propagation



From the WUI...

# What happened

## Role of ornamental hedges in the fire propagation



... to the city center

# What happened

## Role of ornamental hedges in the fire propagation



... to the city center

# What happened

## Role of ornamental vegetation in fire damage



**Château des Barnouins (Les Pennes-Mirabeau)  
2 months after the fire**



# What happened

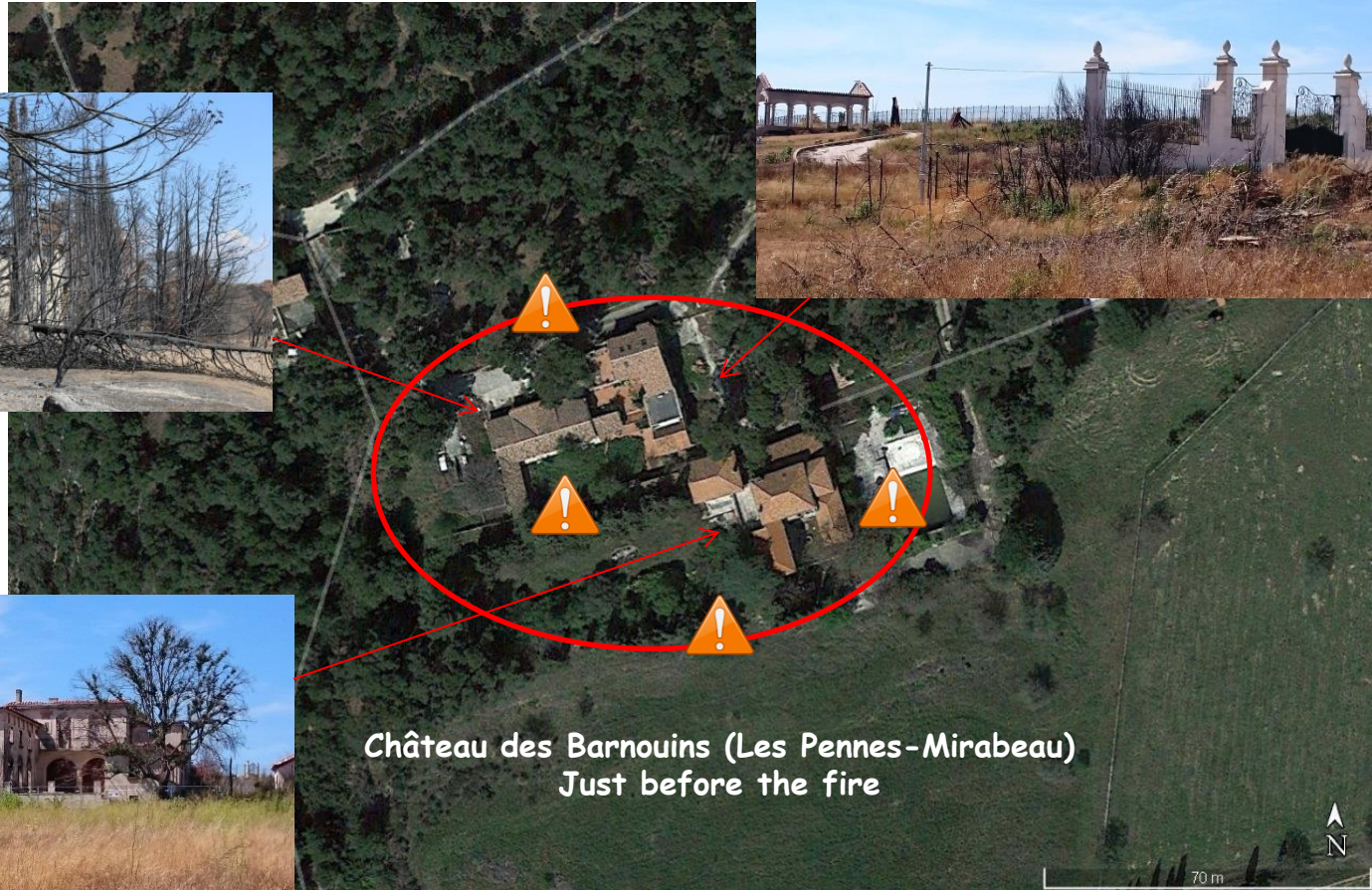
## Role of ornamental vegetation in fire damage



**Château des Barnouins (Les Pennes-Mirabeau)  
One year after the fire**

# What happened

## Role of ornamental vegetation in fire damage



Château des Barnouins (Les Pennes-Mirabeau)  
Just before the fire

# What happened

## Role of ornamental vegetation in fire damage



# Why it happened



## Ornamental vegetation

- Lack of awareness of the fire risk in WUI  
(Residents, land managers, etc.)

CSIRO

# Why it happened

## Regulation on Mandatory Brush-Clearing



Its role on the mitigation of fire behavior



# Why it happened

## Regulation on Mandatory Brush-Clearing



Its role on the mitigation of fire behavior



# Why it happened



## Ornamental vegetation

- Lack of awareness of the fire risk in WUI  
(Residents, land managers, etc.)
- Better knowledge of ornamental vegetation needed

... how it burns

CSIRO

# Why it happened

Knowing which burn well and which do not

➔ Firewise landscaping in WUI





# Why it happened

Knowing which burn well and which do not

➔ Firewise landscaping in WUI



# Conclusions

- Rognac Fire was one of the most destructive fires since 2003
- Fire spread through ornamental vegetation damaging or destroying structures from WUI to city center
- Difficult firefighting due to extreme weather conditions





Thanks for your attention !



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