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Correlation between wildfire statistical data, weather and climate

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Summary

- ...n

- ...limatic Parameters
  - ...itation
  - ...res

- ...
  - ...
  - ...Area
  - ...

- ...

Introduction

- ...udy on a statistical point of

  -
  -

Wildfire and Climatic Parameters

done on lightning ignited fires *

⊙ precipitation
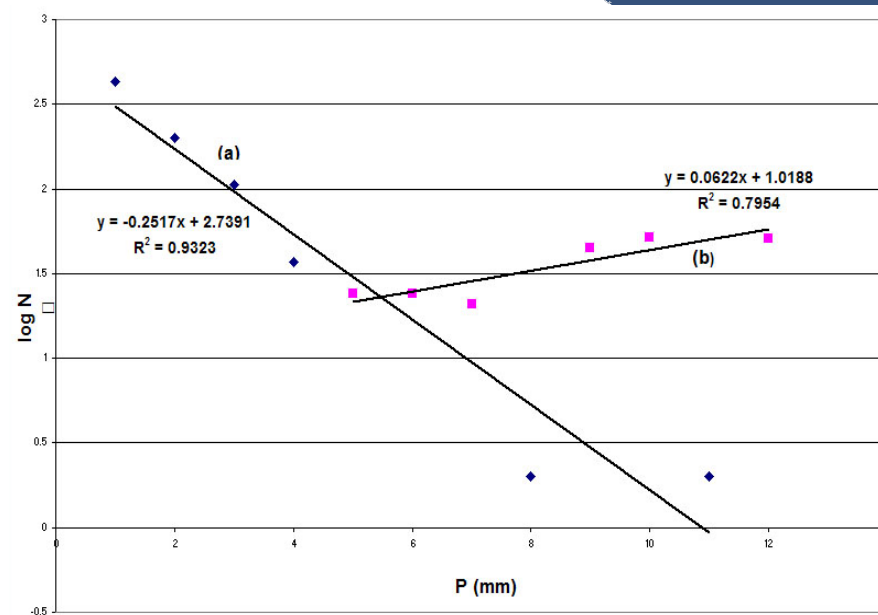
> Western Ontario

-
- 5 region
- a function of P

Result: e is a linear cipitation

Wildfire and Climatic Parameters

⊙   nd precipitation

→   + 0.0622P *For dry and cold period*

→   43P

→   P *For humid and warm period*

Wildfire and Climatic Parameters

⊙ and precipitation

  › Roussillon region

    For dry and warm period

  ›

    d warm period

  ›

    period

  → *On a yearly base:*

    R² = 0.98

Wildfire and Climatic Parameters

- ● d precipitation
  - › of the results

- osystem

- $R^2 = 0.963$

- nsible biomass.

-

Wildfire and Climatic Parameters

roach with chemical kinetics laws *

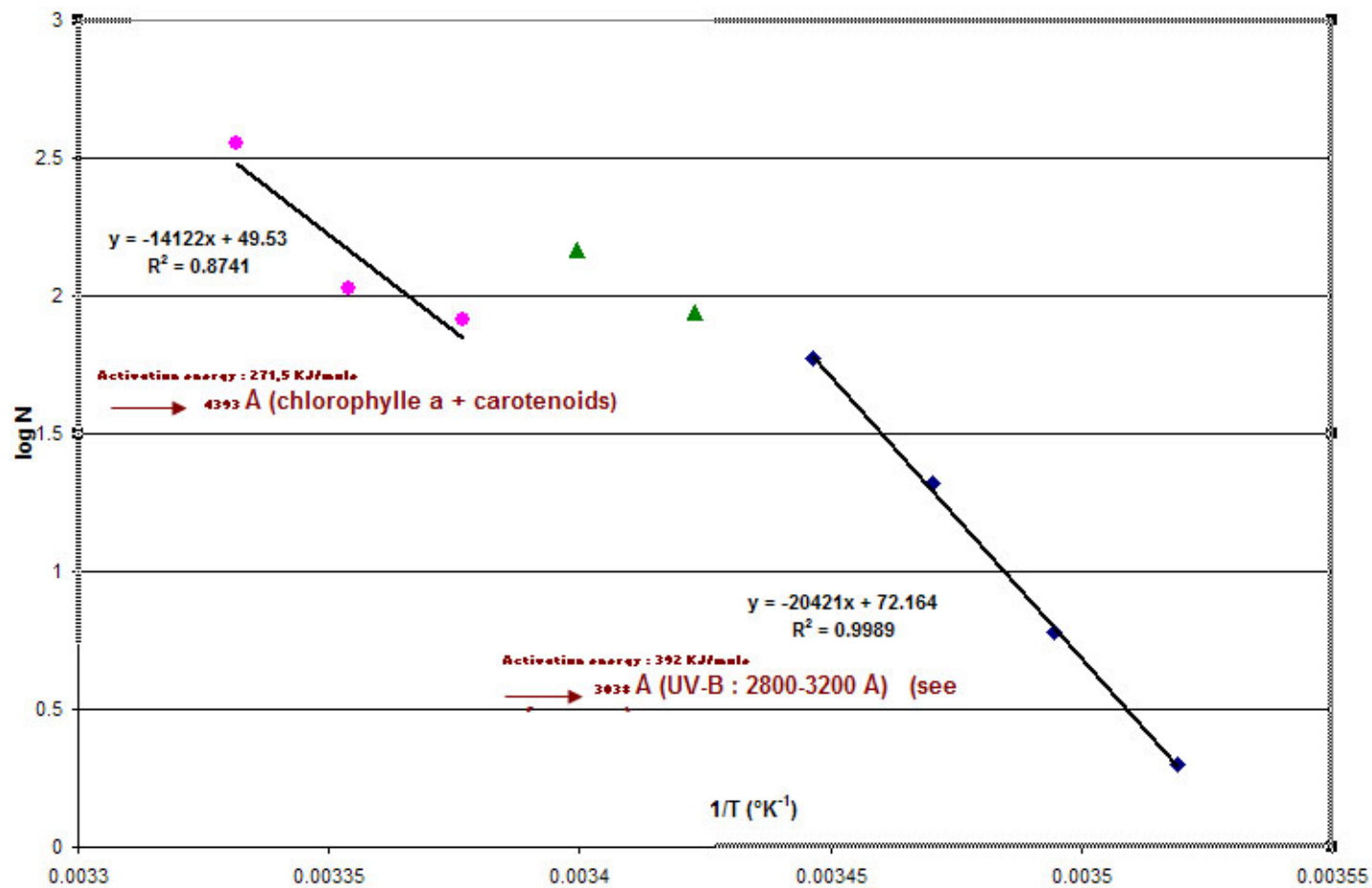⊙   temperature

> $k \, e^{-E/(R.T)}$

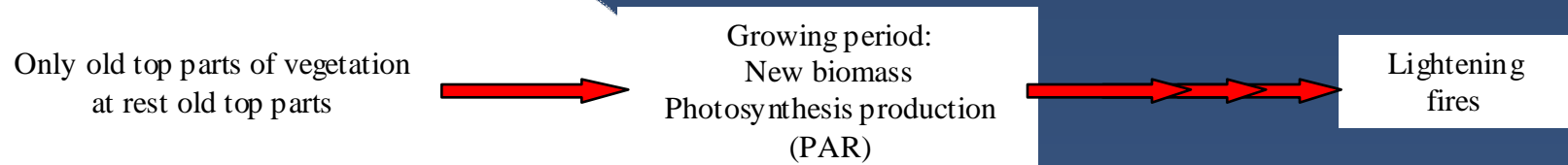>   s of fire occurrence to
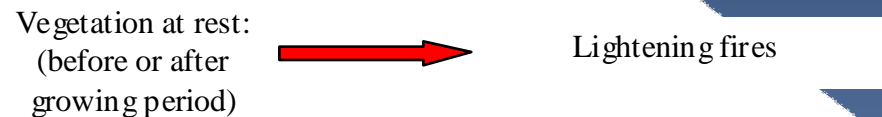
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Wildfire and Climatic Parameters

Wildfire and Climatic Parameters

◉ ...nd temperature

Warmest period

Only old top parts of vegetation
at rest old top parts

→

Growing period:
New biomass
Photosynthesis production
(PAR)

→ → →

Lightening
fires

Rate of global processes (N) controlled by rate of the biomass production

Vegetation at rest:
(before or after
growing period)

→

Lightening fires

Rate of global processes (N) controlled by U.V. flux
(cf climatologic theory of wildland fires, Bernard, 1998, 1999, 2000, 2004, 2005)

Wildfire and Climatic Parameters

log N = f(T). Bouches du Rhône, 1986

Temperature T: Marseilles, monthly average for 1931-1960

Number of fires N : monthly numbers for Bouches du Rhône, 1986

$y = -13375x + 47.017$
$R^2 = 0.9351$

Activation energy : 257 KJ/mol

$y = -27365x + 98.351$
$R^2 = 0.9302$

Wildfire and Climatic Parameters

- ...res in Yellowstone National Park
  - ...an caused fires, the Arrhenius law
    ...th annual occurrences and
    ... (for Class 3 fires)

$\log A = f(1000/T)$: $y = -28.664x + 101.33$
$R^2 = 0.8641$

Apparent activation energy : 551 150 KJ/mole

$\log N = f(1000/T)$: $y = -7.9508x + 28.714$
$R^2 = 0.6682$

log A or log N

1000/T (°K^{-1})
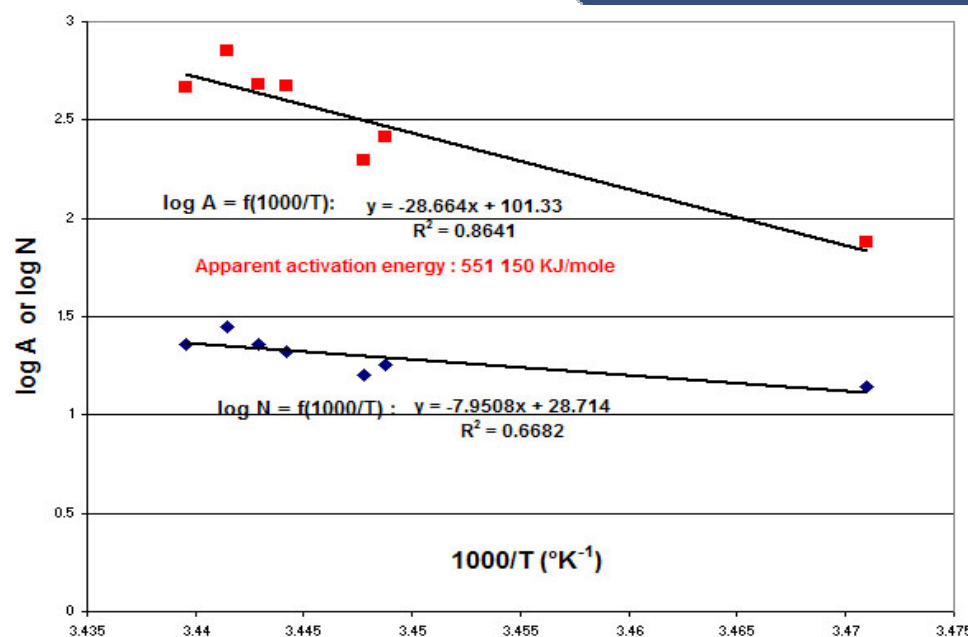
Wildfire and Climate

- vegetation period occurrence
  ction of variable P and T.
  * P

Wildfire and Climate

⦿   North-Western Ontario

-       1.019 + 0.0622P
-       5 – 14,122 / T

-       / T

›   ux Lookout

-       (R2 = 1)
-

Wildfire and Climate

The chart shows P (mm) on the y-axis (0 to 140) versus $1/T_{max}$ (°K^{-1}) on the x-axis (0.00333 to 0.00342). Data points labeled with month numbers 7, 6, 8, and 5.

$$y = -1044227.04x + 3607.72$$
$$R^2 = 1.00$$

-The month number is indicated for each point-
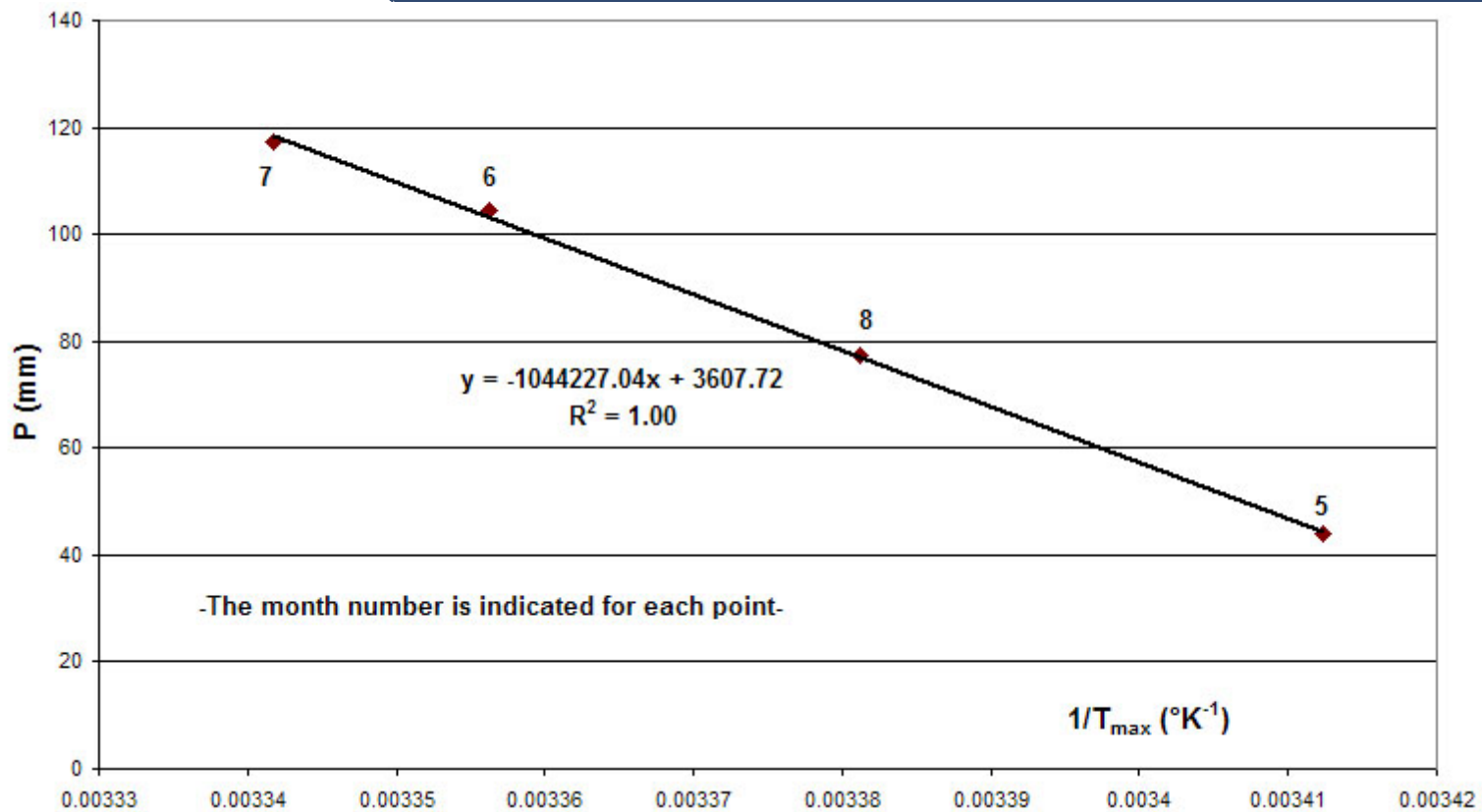
Wildfire and Climate

⊙ Languedoc-Roussillon area

- = 2.896 − 0.0047 P
- 2.034 + 5,797 /T

- 34 *10^6 / T

＞ ntpellier station

- (R^2 = 0.9995)

Wildfire and Climate
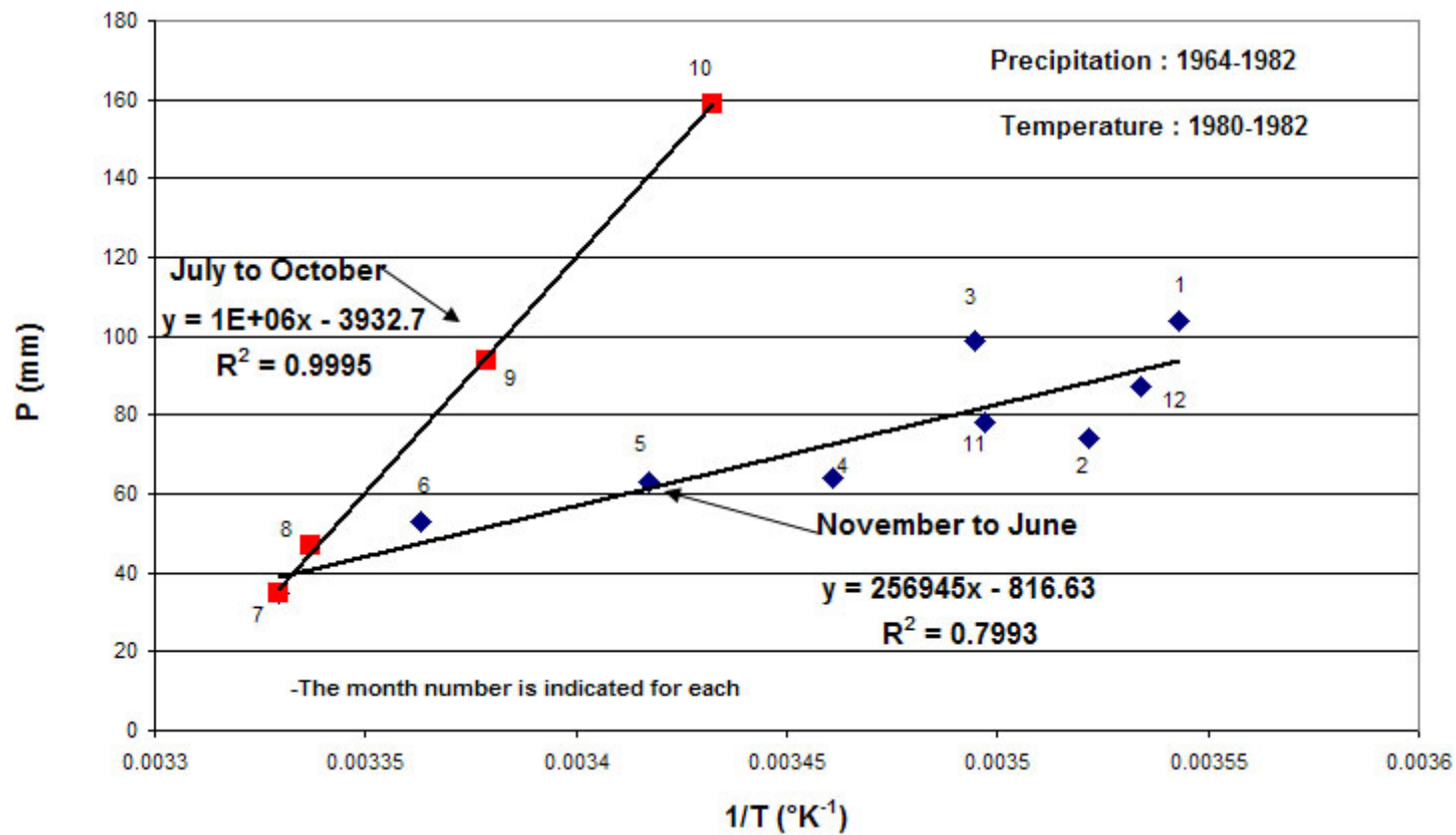
Wildfire and Climate

- ⦿ of climatologic chart
  - Nimour 2004
  - historic representations of tics
  - climate changes

Conclusion

- between Wildfires and
  meters

- chart (refer to poster 8)

- rmation:

  le.fr

THE END

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