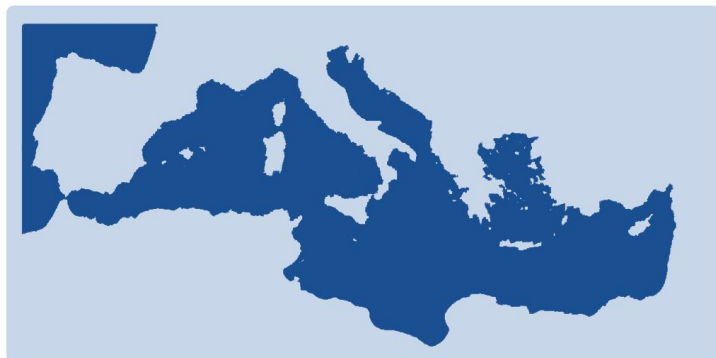


Climate Local Information in the Mediterranean  
region Responding to User Needs



# CLIM-RUN



**NATIONAL  
ATHENS**

**OBSERVATORY**

**OF**

**<http://www.climrun.eu>**



## Providing tailored climate information to forest fire stakeholders and end-users

**C. Giannakopoulos (NOA, Greece)**

V. Kotroni (NOA, Greece)

K. Lagouvardos ((NOA, Greece)

E. Korakaki (WWF, Greece)

M. Hatzaki (NOA, Greece)

V. Tenentes (NOA, Greece)

A. Roussos (NOA, Greece)

A. Karali (NOA, Greece)

C.M. Goodess (CRU, UK)



## Wild fire case study objectives

- This case study focuses on the analysis of the climate information required in areas where forest fires represent a major hazard through organisation of interaction strategies (mainly workshops) with relevant stakeholders.



## Workshop objectives

- To present the CLIM-RUN project and the concept of climate services
- To provide an overview of state-of-the-art in climate modelling, observations and impacts analysis on forest fires
- To better understand who are the climate services stakeholders
- To begin to define what you need/want from climate services



## The ‘who’ and the ‘what’

- Who are the climate services stakeholders?
  - Short term fire planning
  - Long term fire policy making
  - Educational stakeholders
- What do you need/want from climate services?
  - Specific data / calculations
  - Web-based analysis tools
  - Guidance and training tools

We present real applications that serve the needs of stakeholders





# Fire risk forecasts on an operational basis for the Greek territory

The fire risk forecast based on FWI values can be found at <http://cirrus.meteo.noa.gr/forecast/bolam/index.htm>

Under  
Forest Fires - CFWI

The screenshot displays the National Observatory of Athens website, specifically the BOLAM model forecast page. The page features a navigation menu on the left with various forecast categories. The main content area shows a map of Greece with a color-coded temperature forecast at 2 meters. A sidebar on the right provides information about mobile forecasts and general info. The bottom of the page includes sections for sea forecasts, Attica coasts, and the FLASH project.

**National Observatory of Athens**  
INSTITUTE FOR ENVIRONMENTAL RESEARCH - WEATHER FORECASTS

**Navigation Menu:**

- Europe : forecasts
- Europe :4-5 d. forecasts
- Europe :large : forecasts
- Greece : forecasts
- Greece :4-5 d. forecasts
- Athens : forecasts
- Greek Cities forecasts
- Olympic Venues
- Sailing forecasts
- Forecasts in Greek
- Forest fires
- Forest fires -CFWI
- WRF model
- MM5 model
- Wave forecasts-Med
- Wave forecasts-Greece
- Global models
- Observations-NOA
- Observations
- Verification
- Monthly bulletins
- About our group
- Contact us

**BOLAM model**

**AIR TEMPERATURE AT 2 M**

Map of Greece showing temperature forecast at 2 meters. Color scale ranges from 0.00 to 40.00.

**WEATHER FORECASTS ON YOUR MOBILE**

Using your mobile phone you can get weather forecasts for 200 cities and 25 sea areas over Greece.

Just send an SMS to **54045**, following the instructions provided [here](#). (0.3 Euro per sms, VAT included).

**WEATHER IN JUNE OVER GREECE**

June 2012 was a month with temperature much higher than the average values, dry over the major part of the country. For more info, look at the June 2012 bulletin (click on the Monthly bulletins button on the left menu).

**GENERAL INFO**

Daily forecasts are issued for Europe, Greece and Athens area by three models: **BOLAM**, **MM5** and **WRF**. Detailed forecasts are issued for 40 major Greek cities, as well as for selected locations over the Greek seas (sailing forecasts). Forecasts are presented as maps, time-plots, word text and outlook tables. Surface observations over Europe and Greece, satellite pictures, satellite winds, soundings as well as lightning data from NOA's ZEUS lightning detection system are also presented.

**ABOUT THE MODELS**

BOLAM, MM5 and WRF models are executed daily at the National Observatory of Athens, using two PC clusters, providing the more detailed weather forecasts available today in Greece. **BOLAM model** was developed at ISAC-Bologna (Italy). **MM5 model** was developed at the Pennsylvania State University. **WRF model** is a next generation mesoscale model, designed to serve both

**FORECAST PRODUCTS FOR SEA**

NOA distributes wind forecasts in GRIB format, that can be used by special marine software. For subscription information please [click here](#).

**ENJOY ATTICA COASTS**

NOA issues detailed weather forecasts for 13 beaches over Attica. In order to view these forecasts, first click on the **MM5 model** above, then click on the **Attica Coasts** button and ...enjoy the sea!

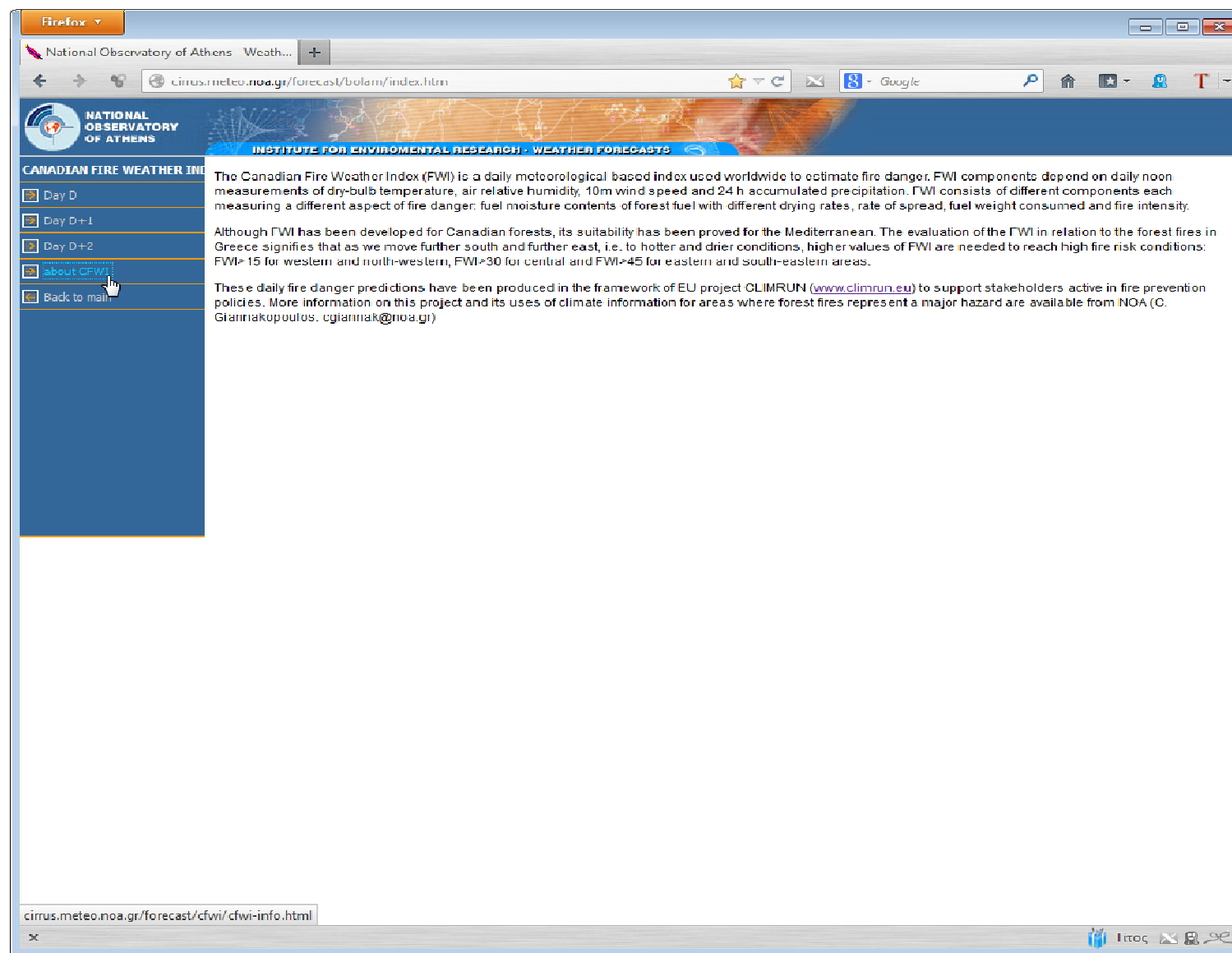
**FLASH PROJECT**

NOA participates in the EU-funded FLASH project, with the aim to observe, analyse and model lightning activity over the Mediterranean. More info about the project is [given here](#).





# Fire risk forecasts on an operational basis for the Greek territory

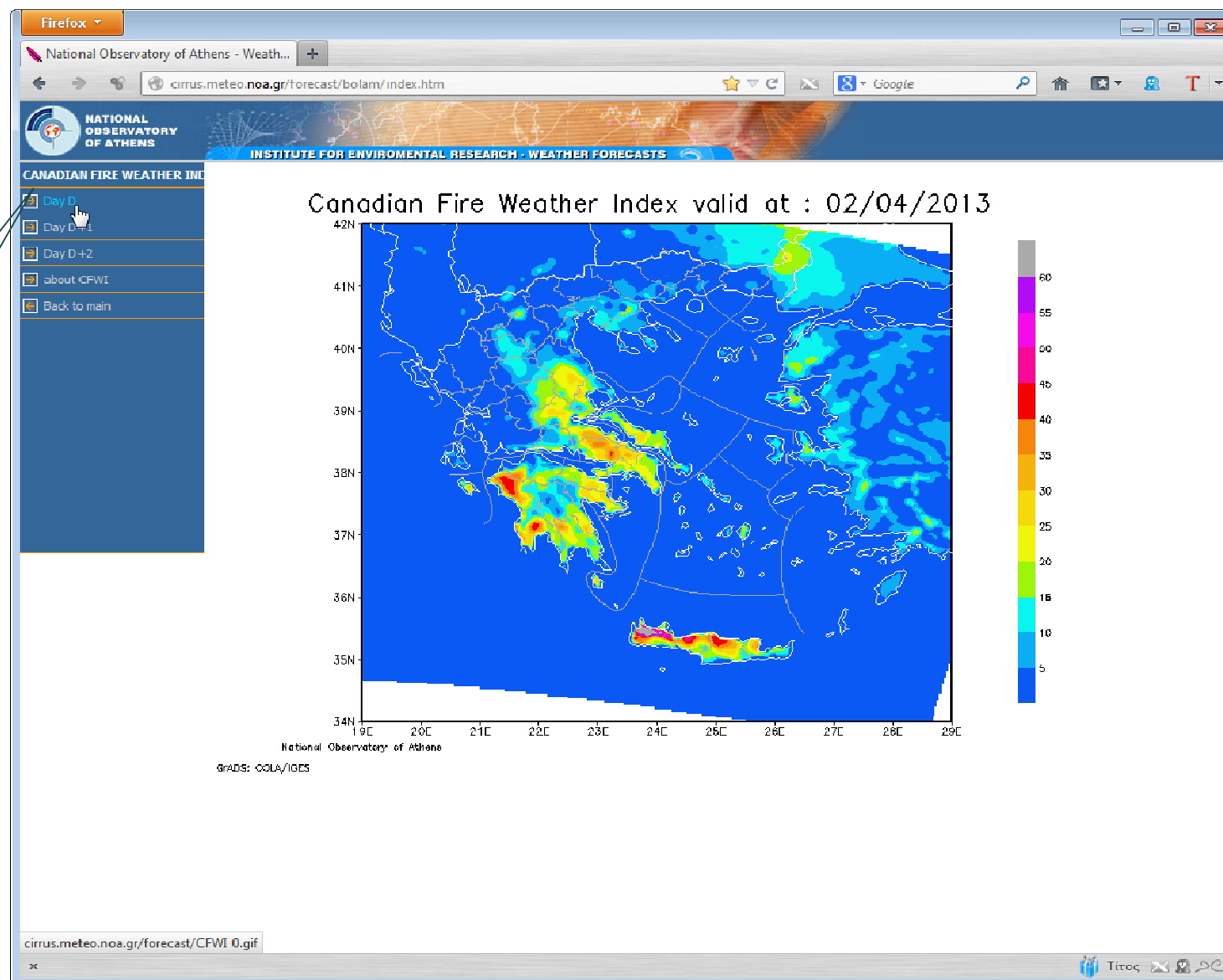






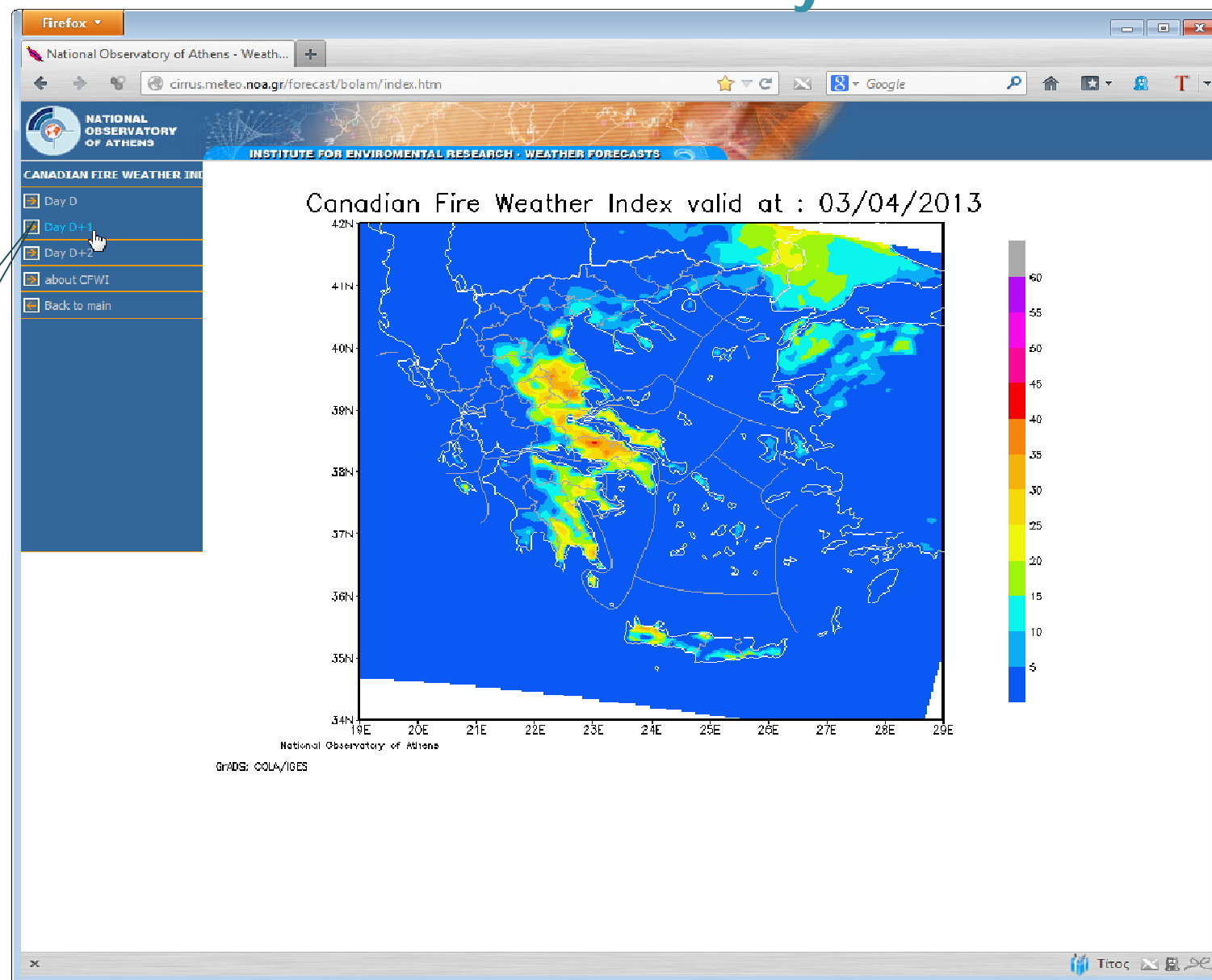
# Fire risk forecasts on an operational basis for the Greek territory

DAY D





# Fire risk forecasts on an operational basis for the Greek territory

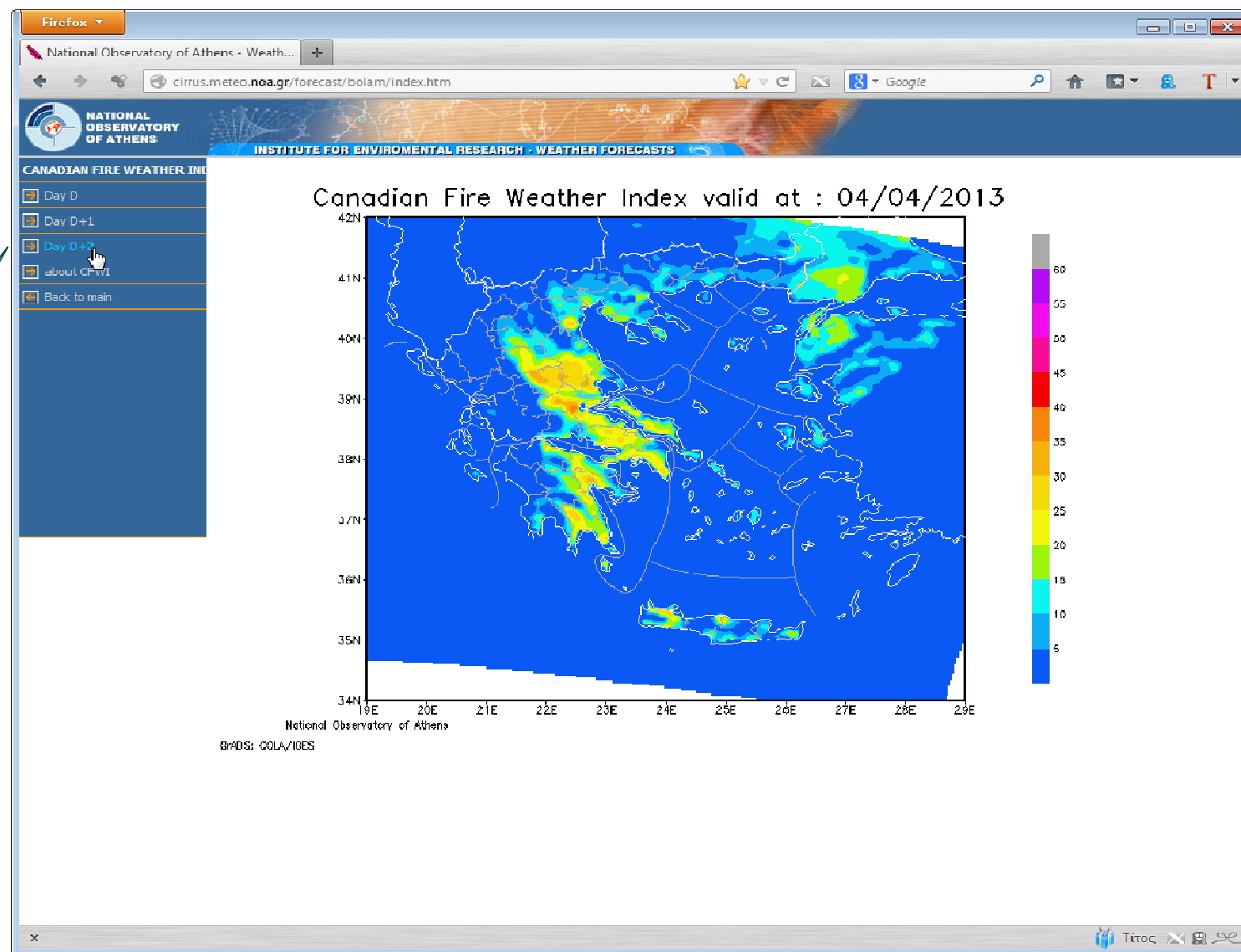


DAY  
D+1





# Fire risk forecasts on an operational basis for the Greek territory



DAY  
D+2

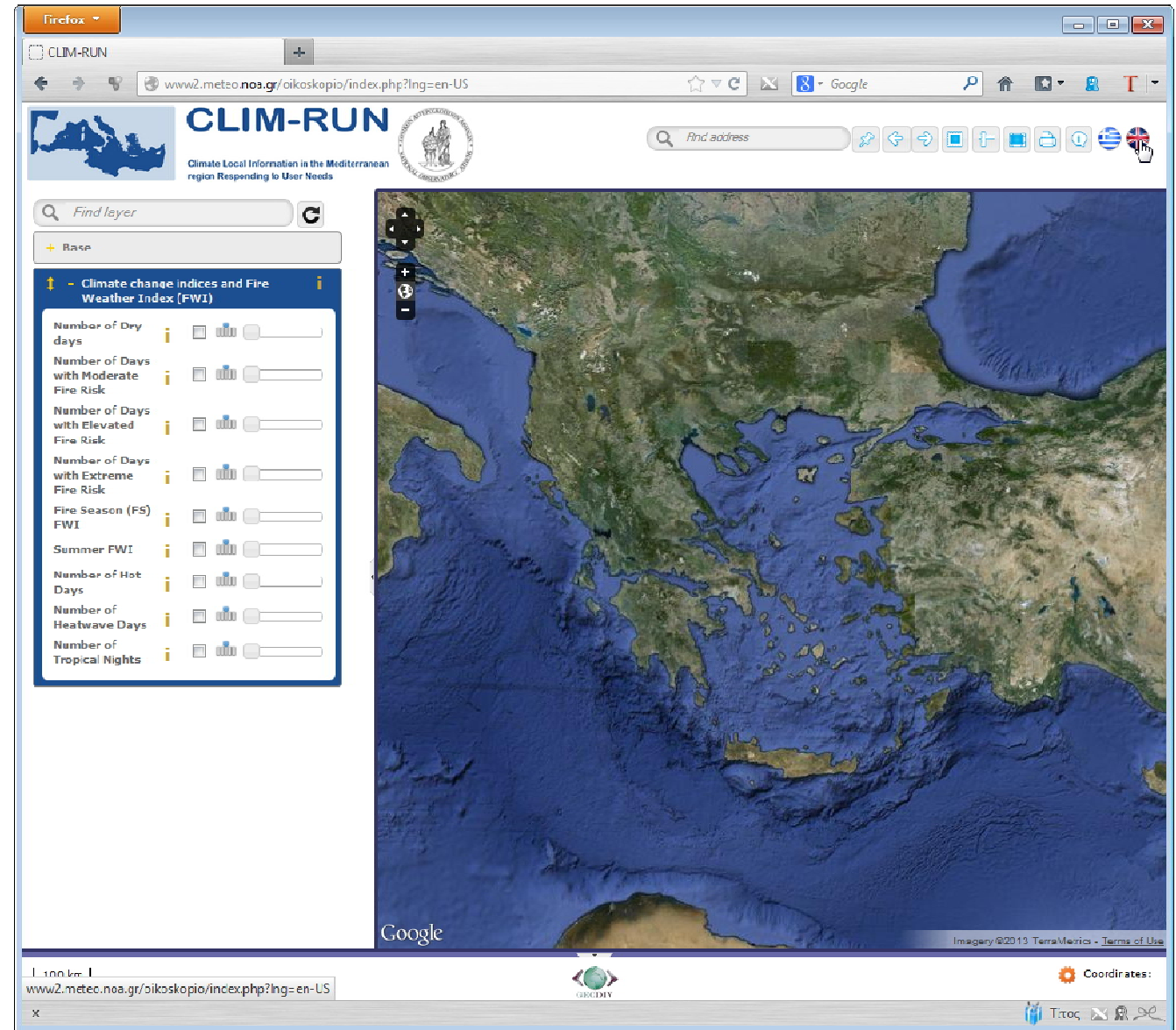




# Web tool for future projections of climate extremes for the Greek territory

The future projections of climate extremes in relation to fire risk can be found at:

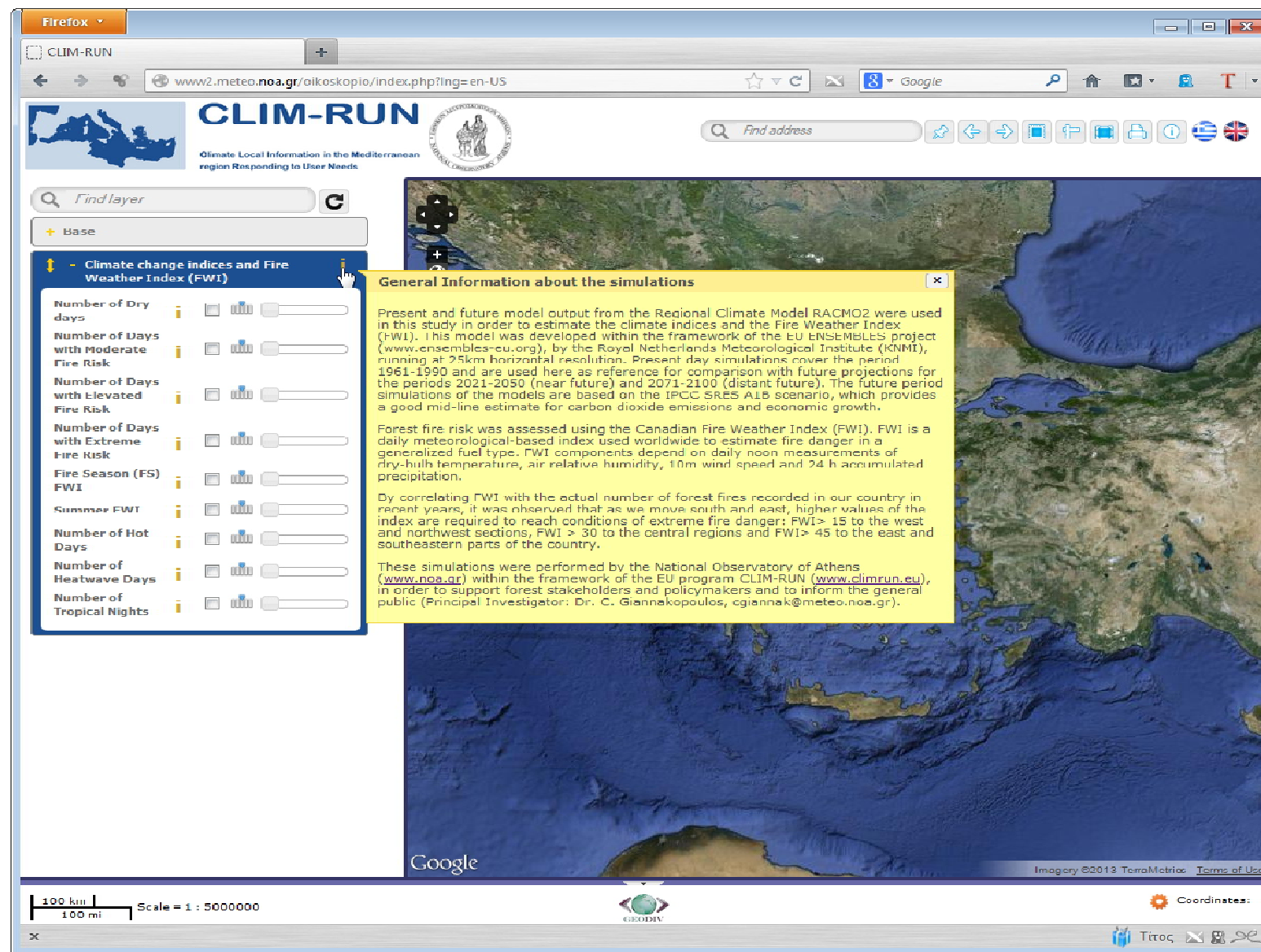
<http://www.meteo.noa.gr/oikoskopio/>







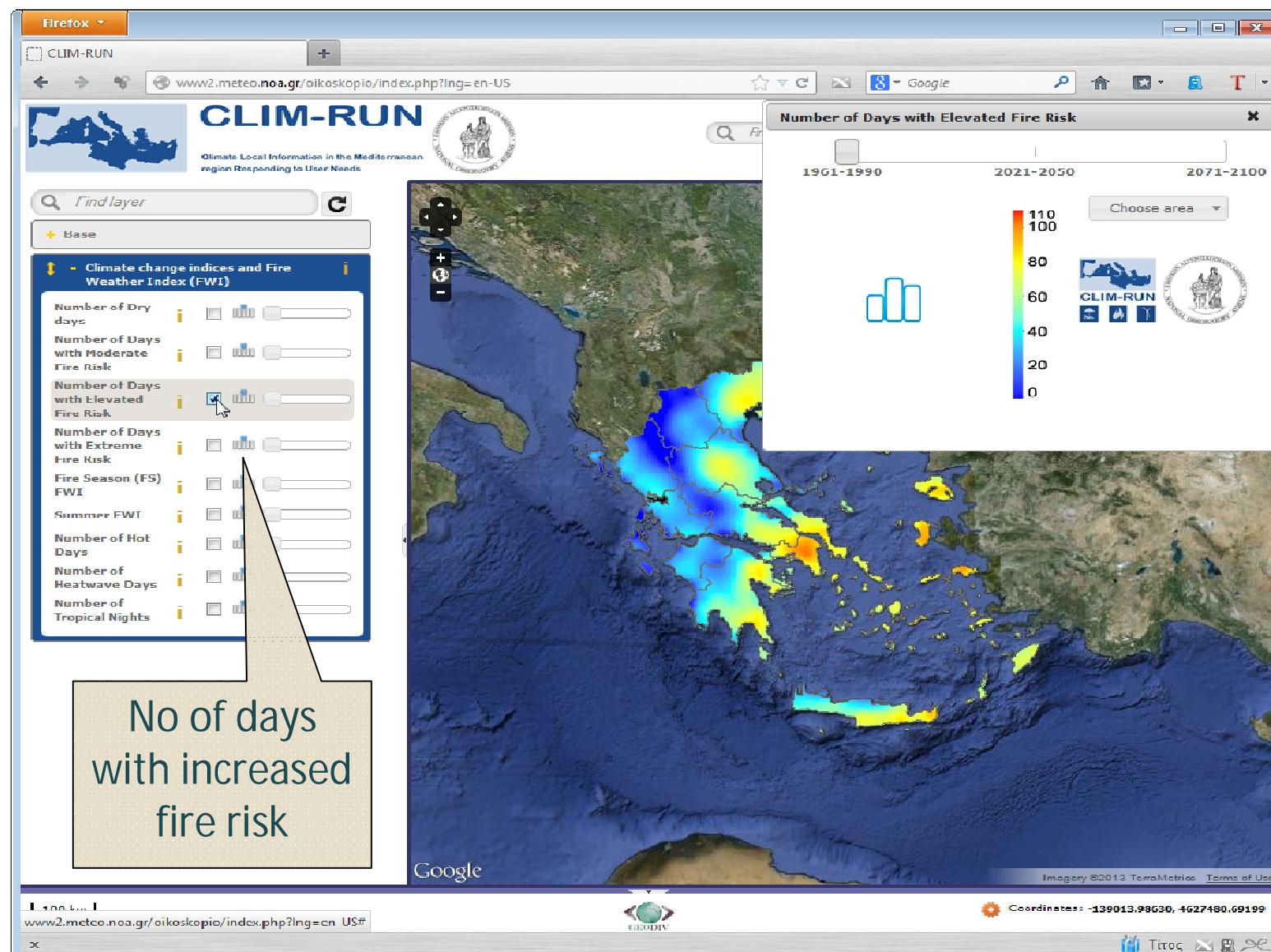
# Web tool for future projections of climate extremes for the Greek territory







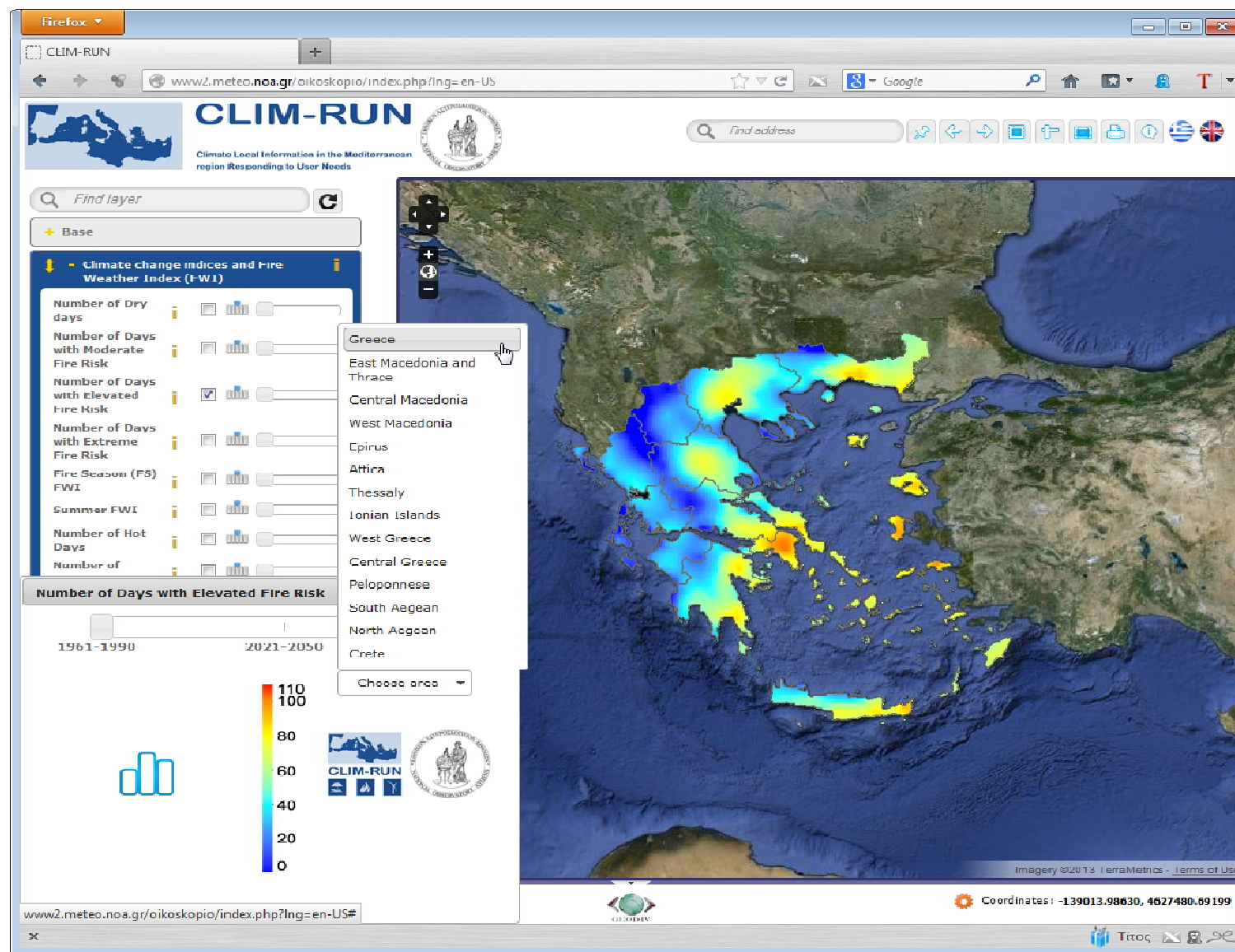
# Web tool for future projections of climate extremes for the Greek territory







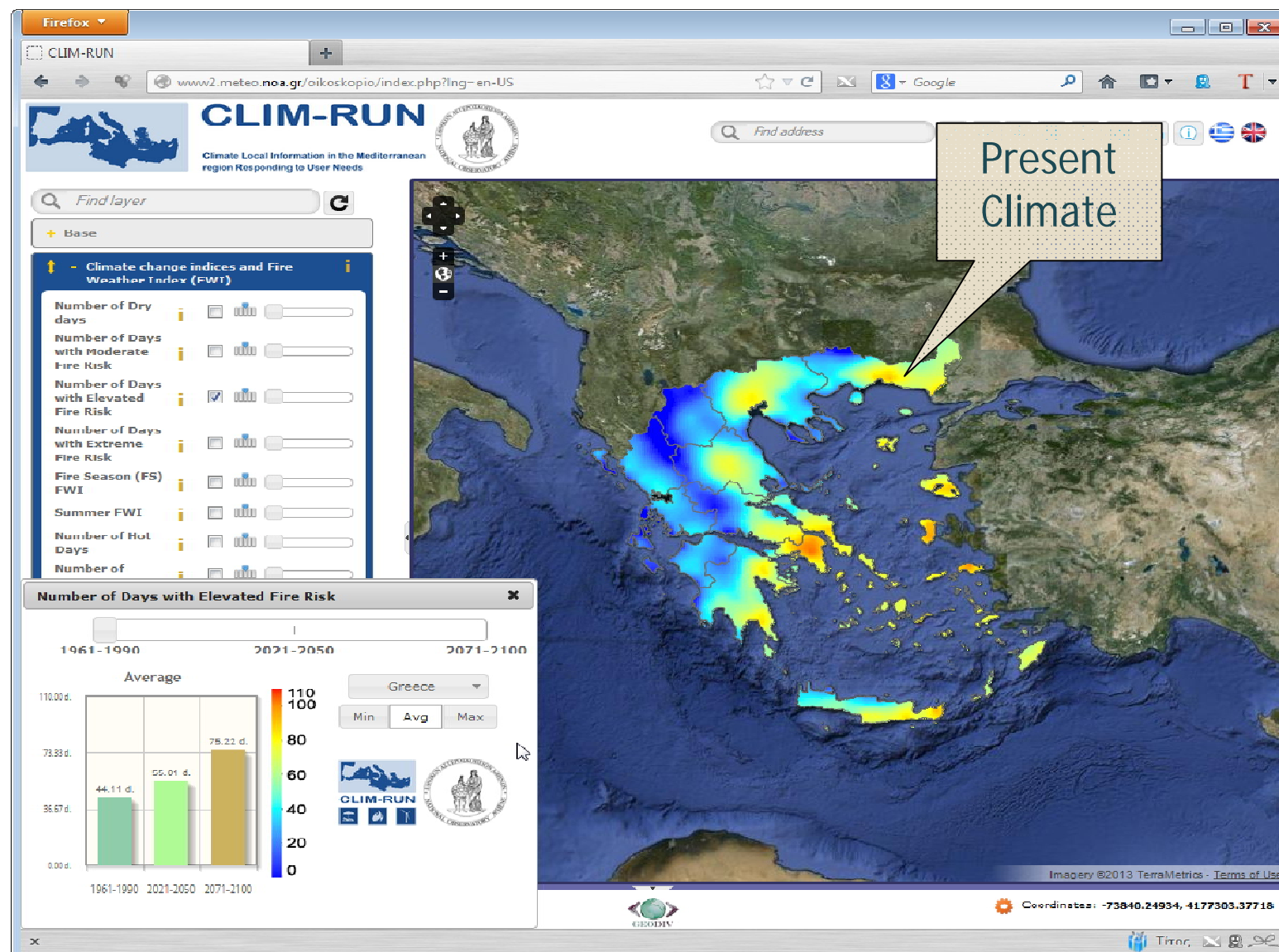
# Web tool for future projections of climate extremes for the Greek territory







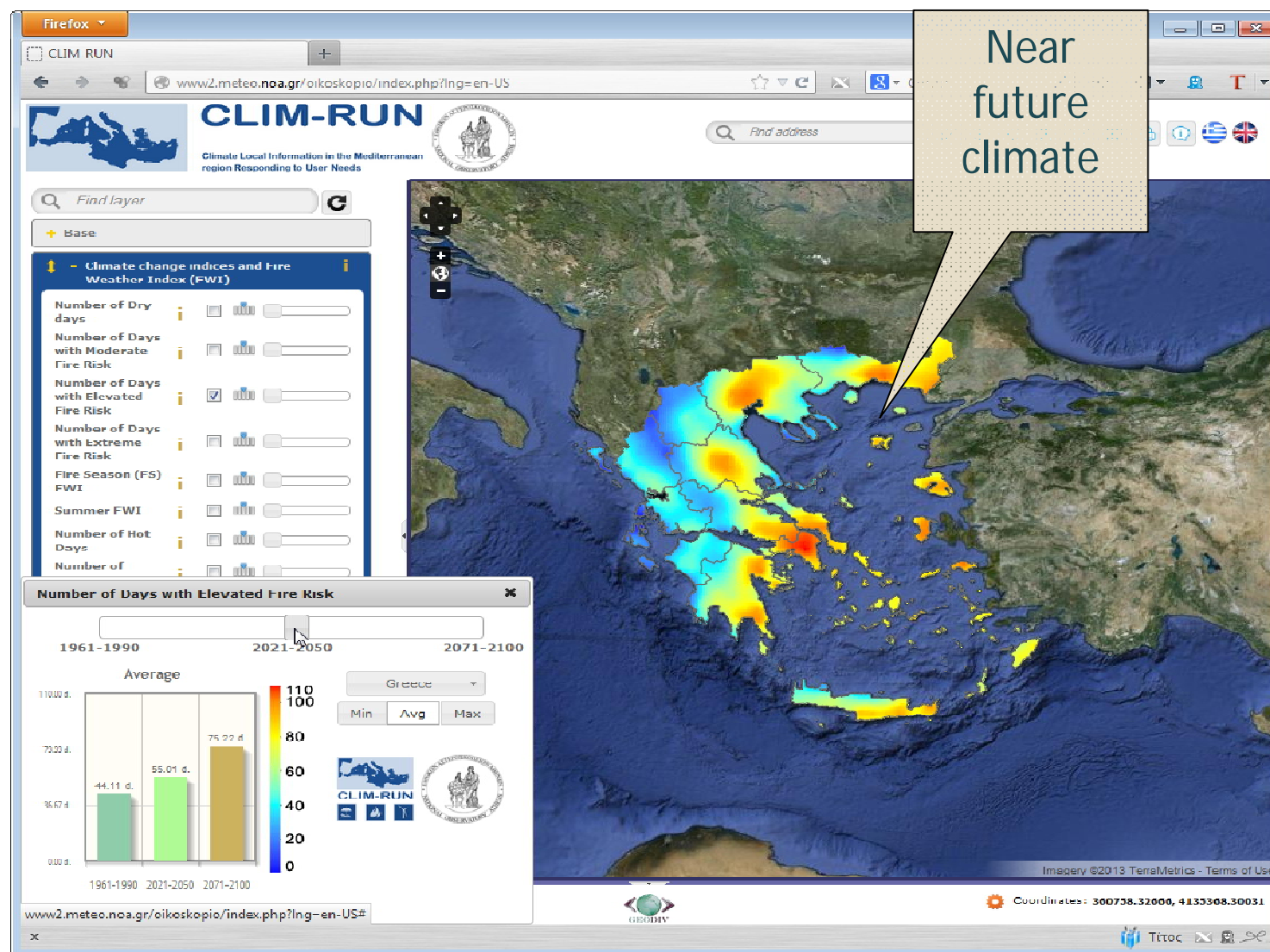
# Web tool for future projections of climate extremes for the Greek territory







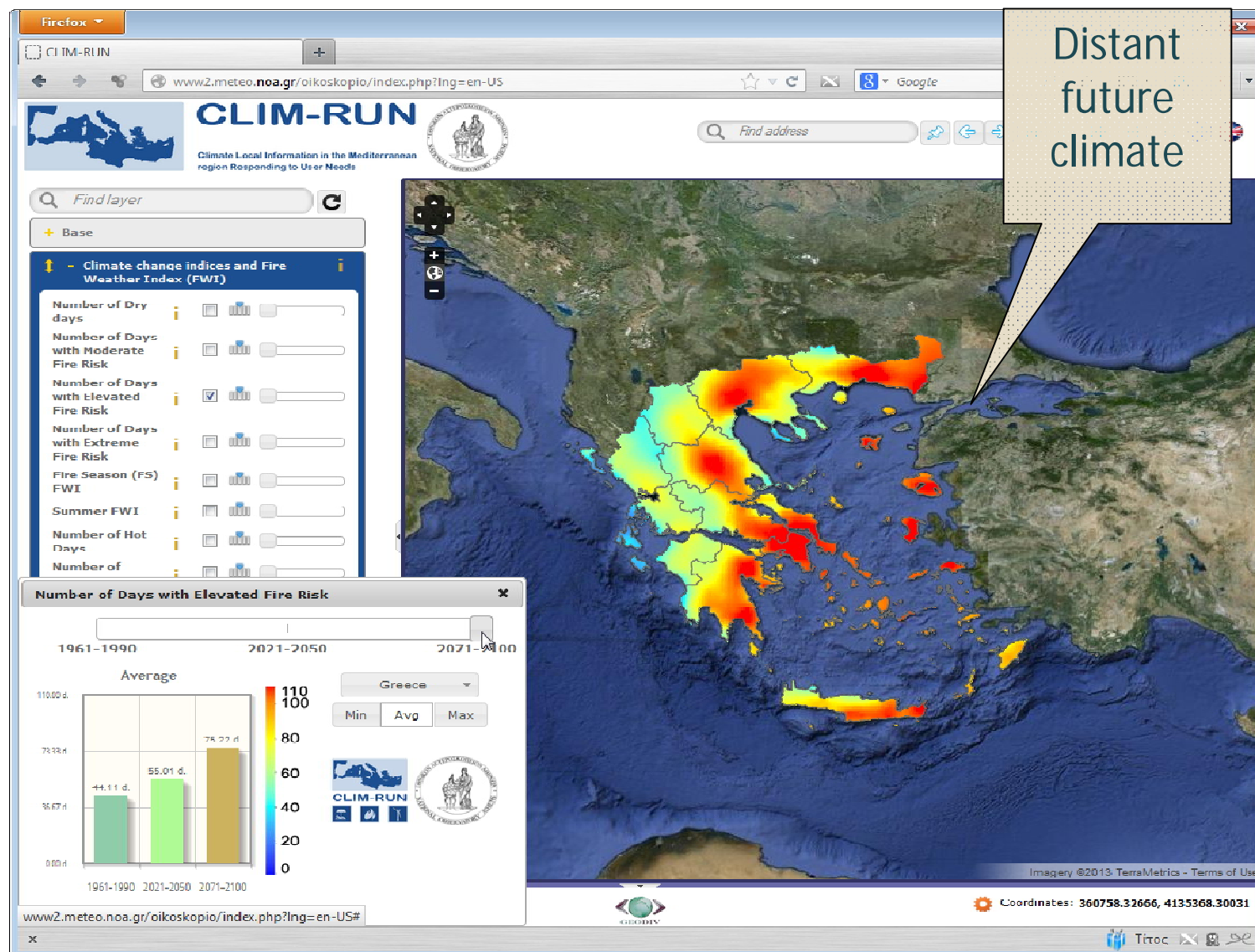
# Web tool for future projections of climate extremes for the Greek territory







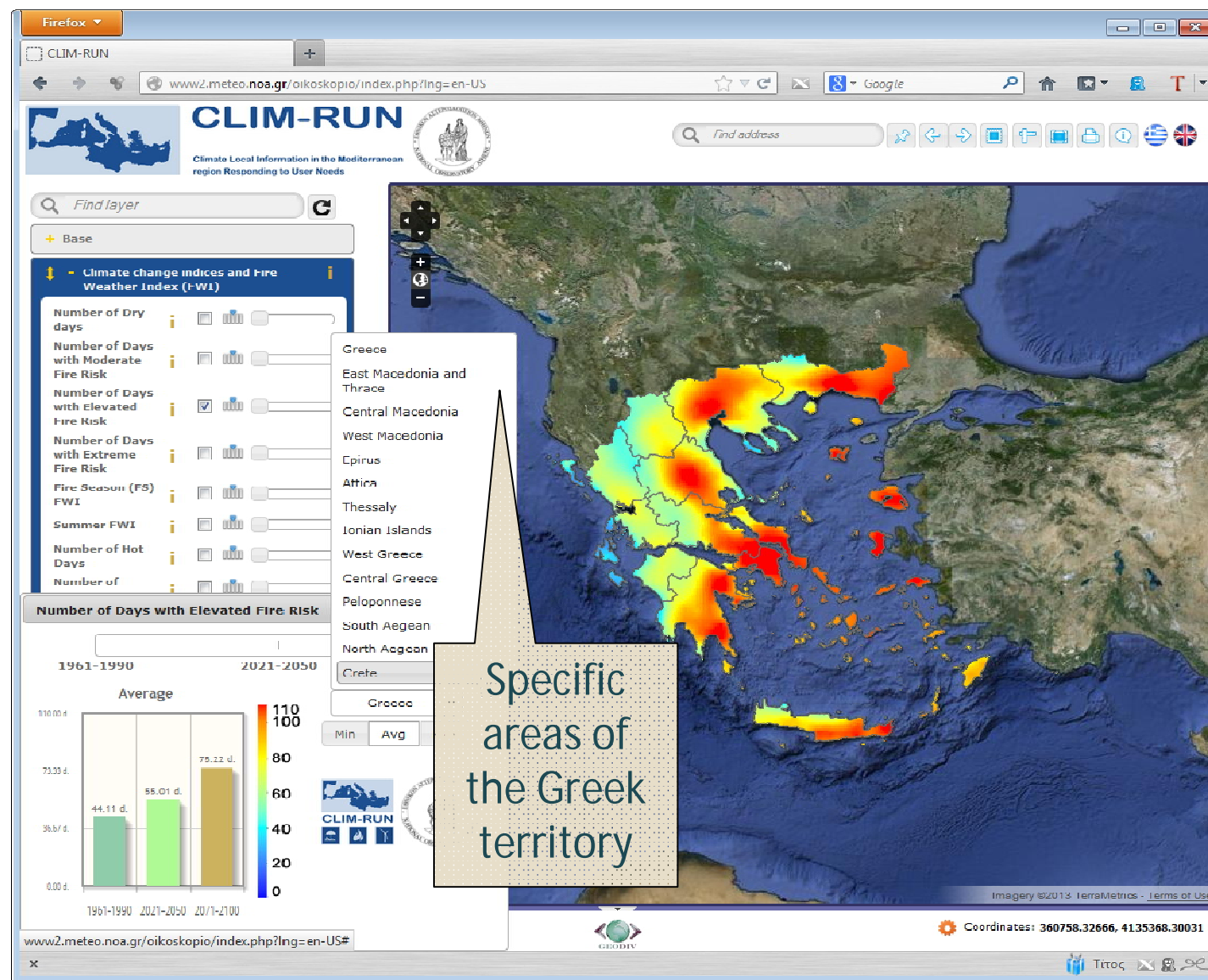
# Web tool for future projections of climate extremes for the Greek territory







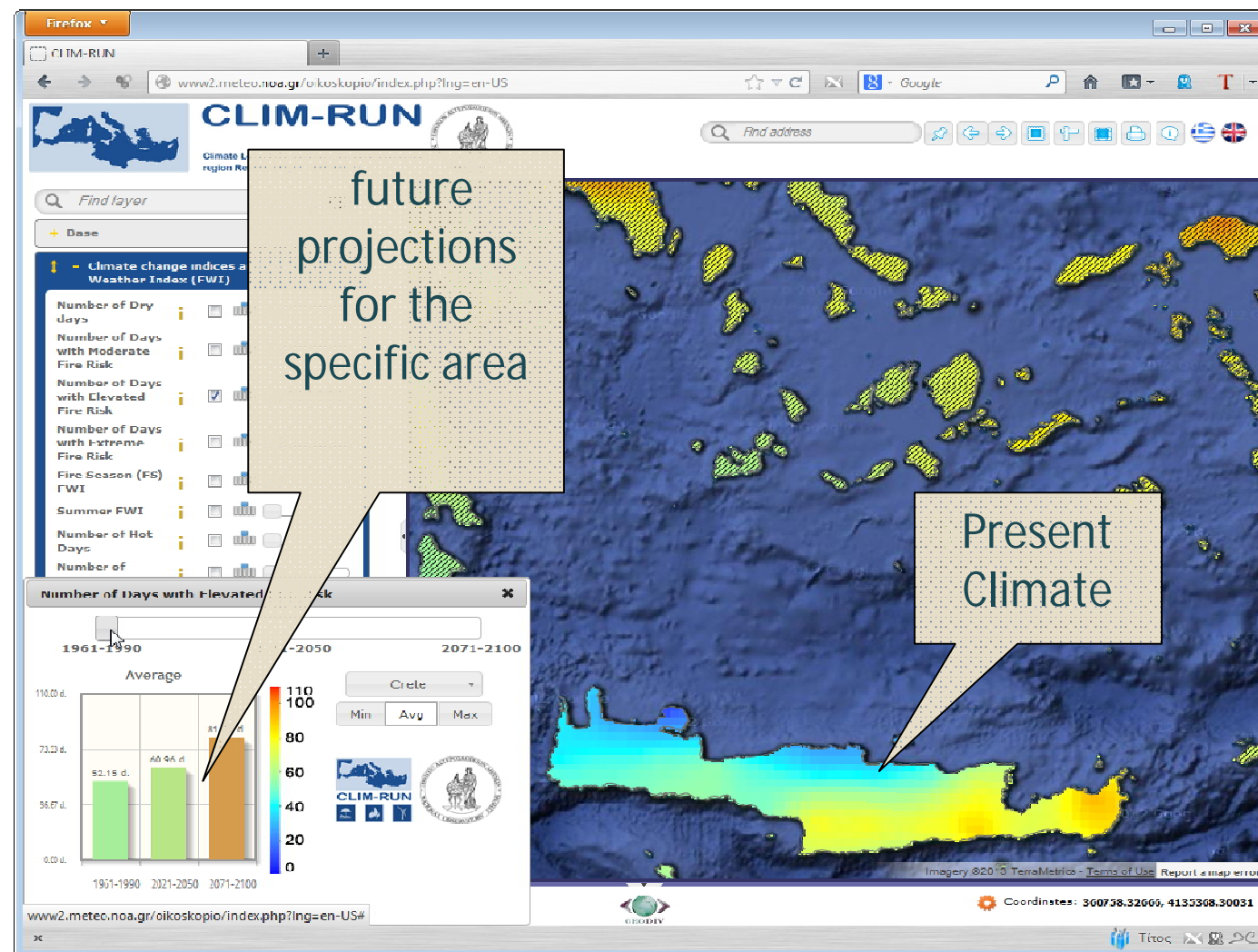
# Web tool for future projections of climate extremes for the Greek territory







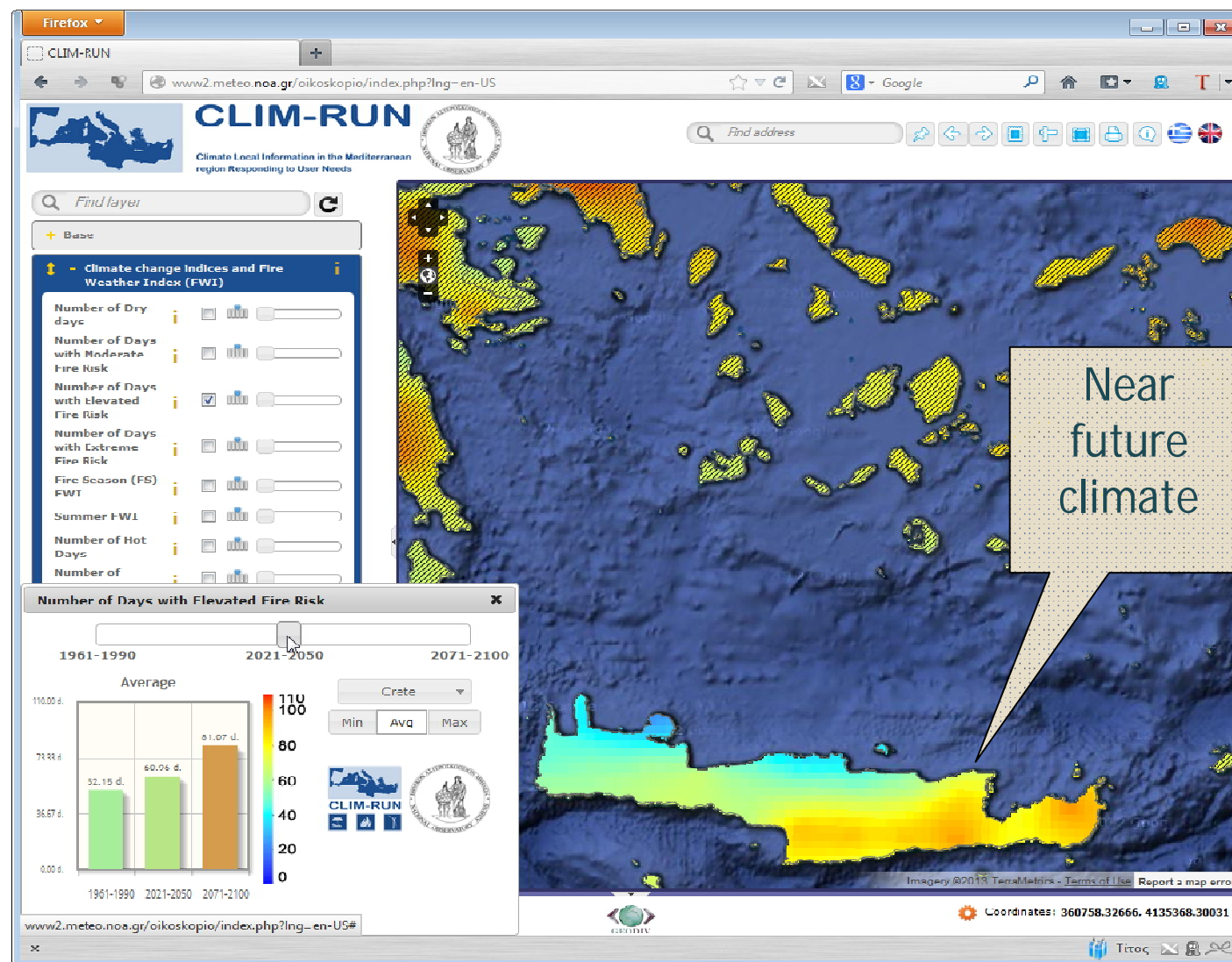
# Web tool for future projections of climate extremes for the Greek territory







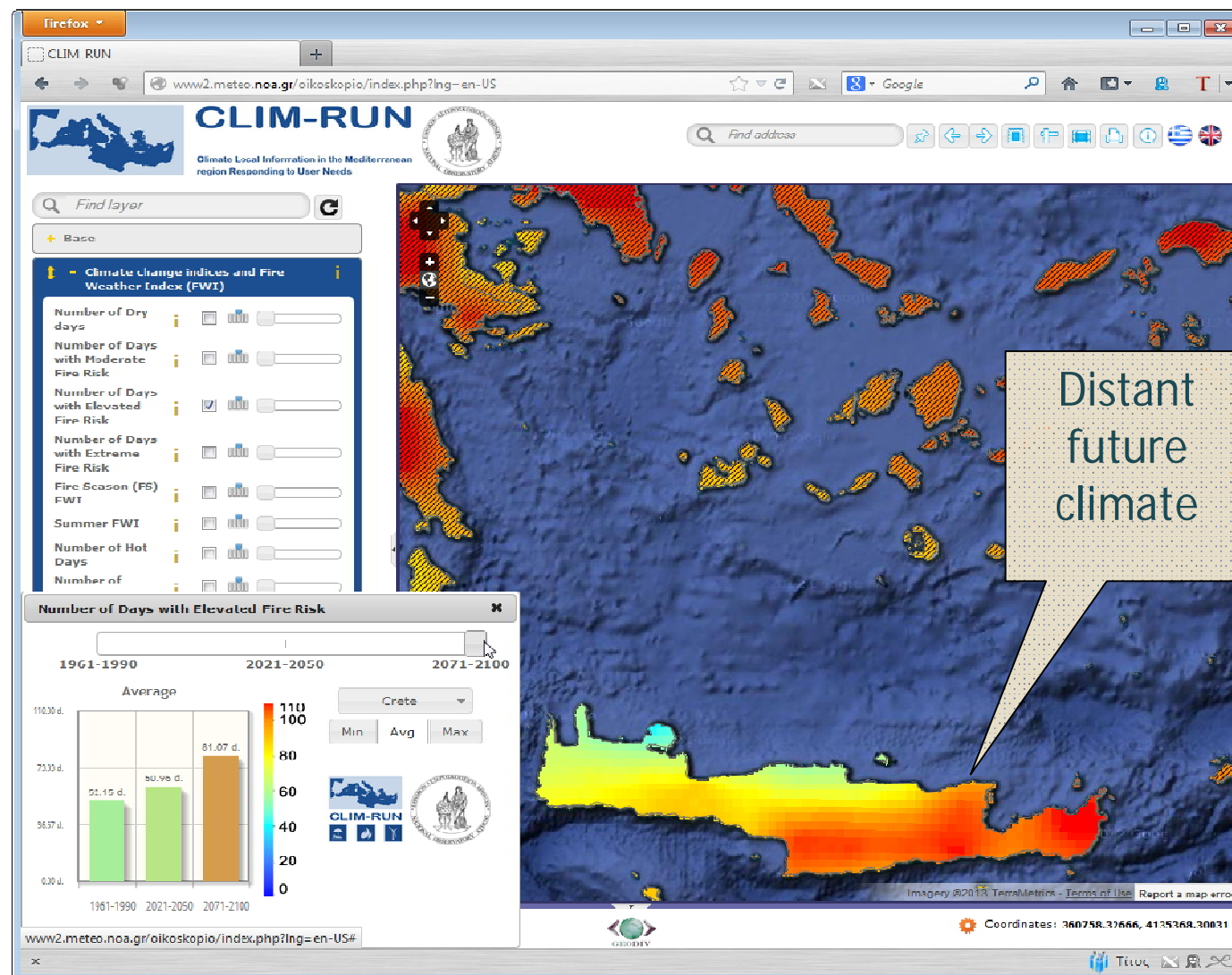
# Web tool for future projections of climate extremes for the Greek territory







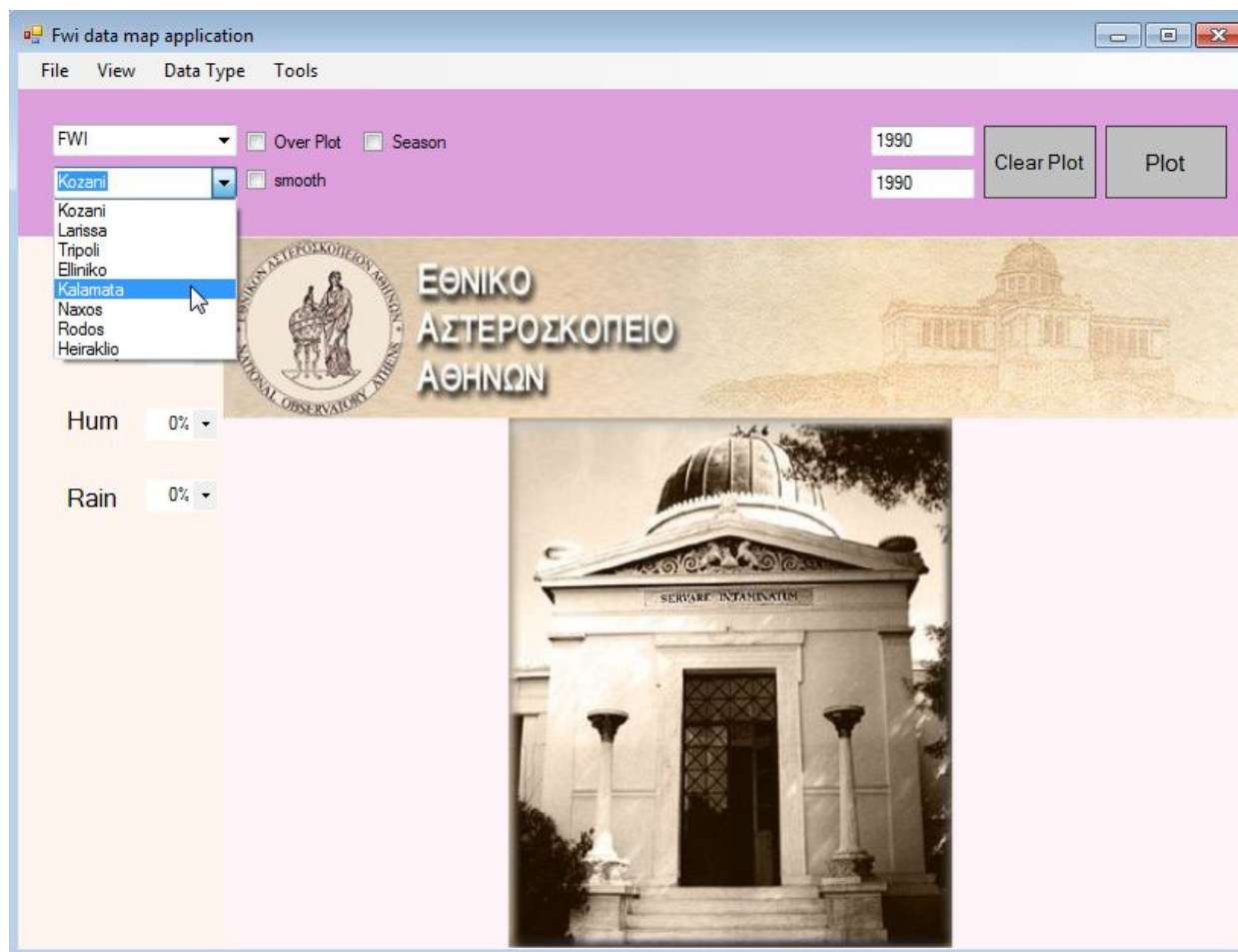
# Web tool for future projections of climate extremes for the Greek territory







# Software tool for Fire Weather Index Using Station/model Data



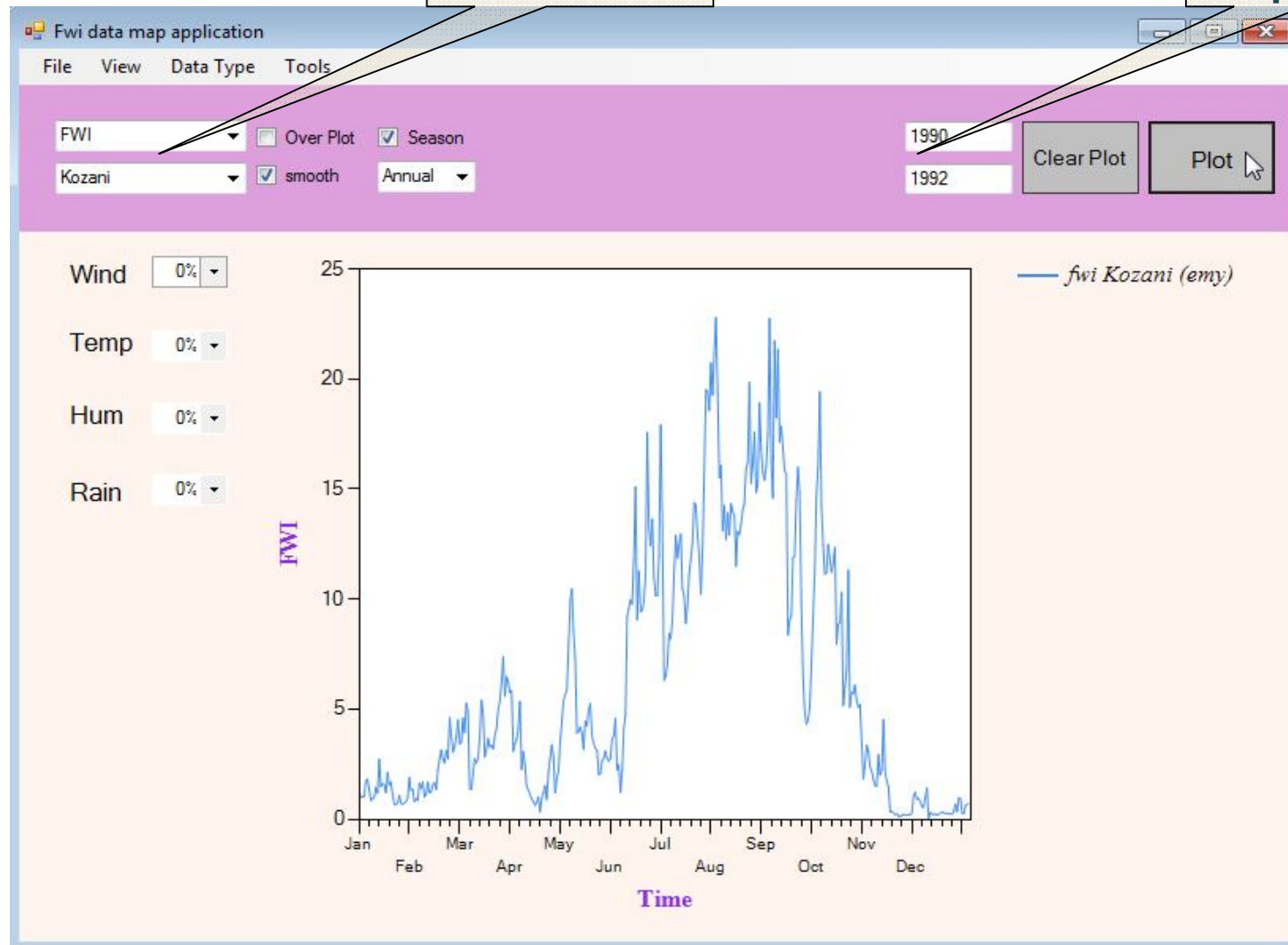




# Software tool for Fire Weather Index Using Station/model Data

Select Station  
Data

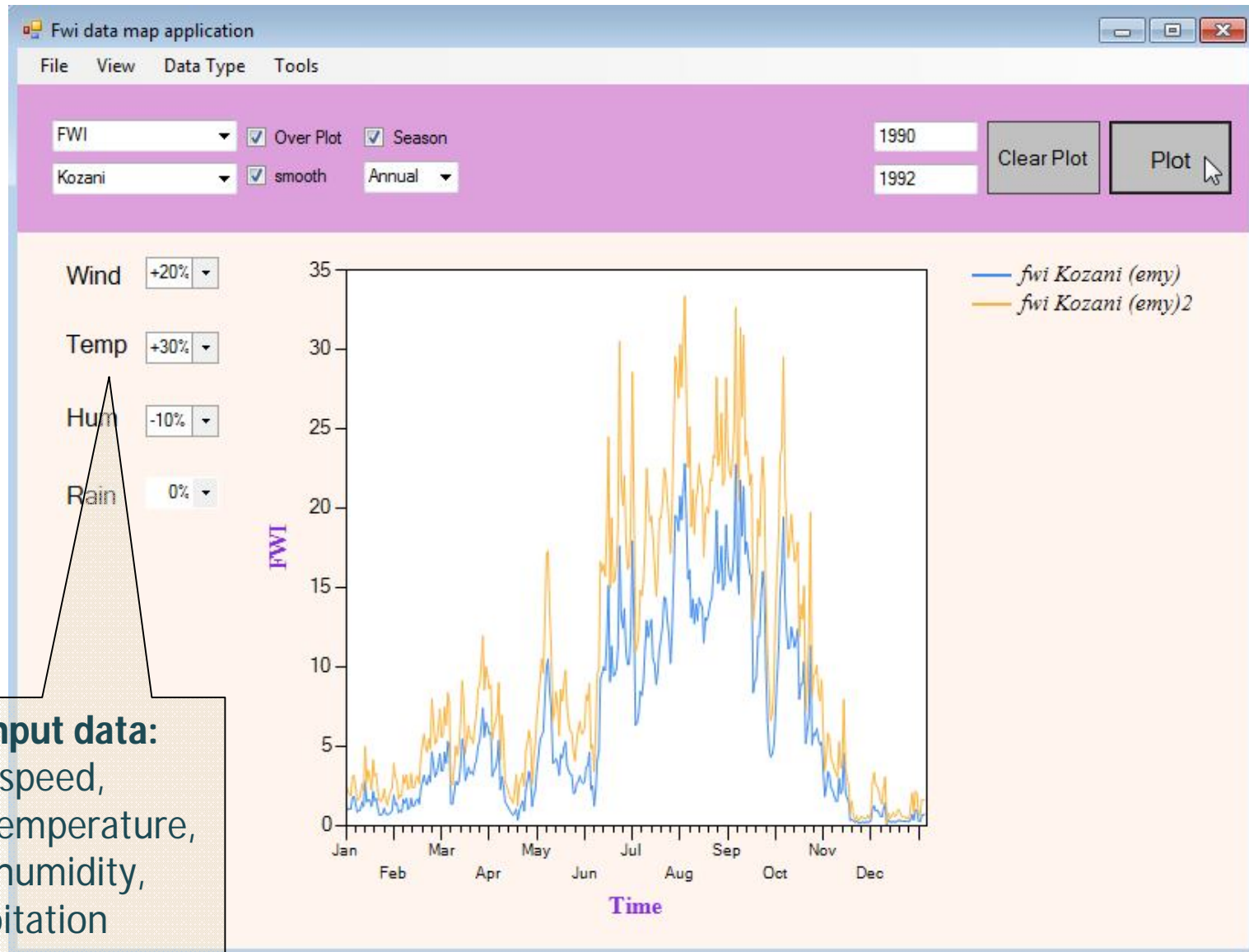
Select time  
period







# Software tool for Fire Weather Index Using Station/model Data



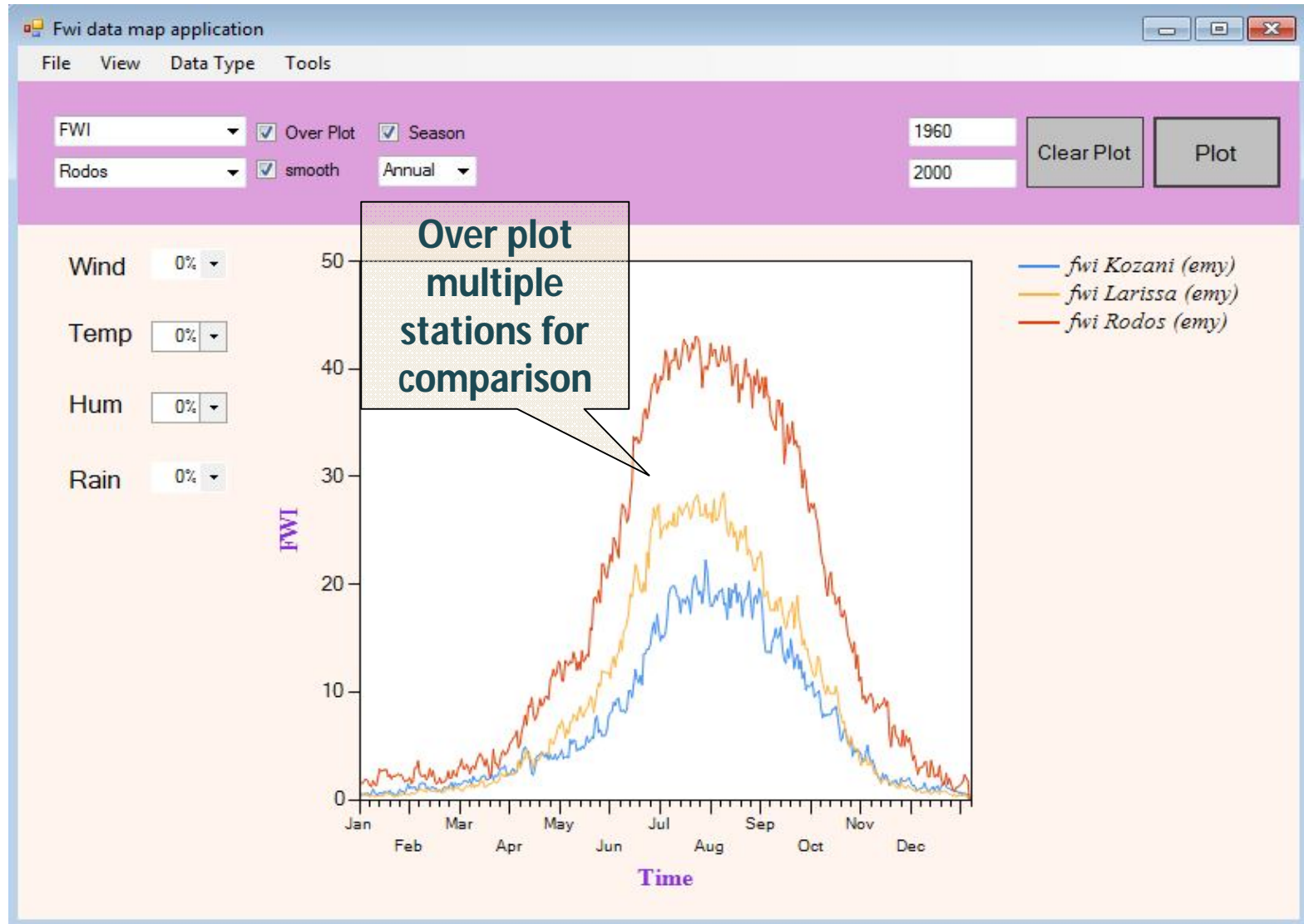
## Modify input data:

Wind speed,  
maximum temperature,  
relative humidity,  
precipitation





# Software tool for Fire Weather Index Using Station/model Data







# Software tool for Fire Weather Index Using Station/model Data

**Export  
calculated  
indices in  
data files**

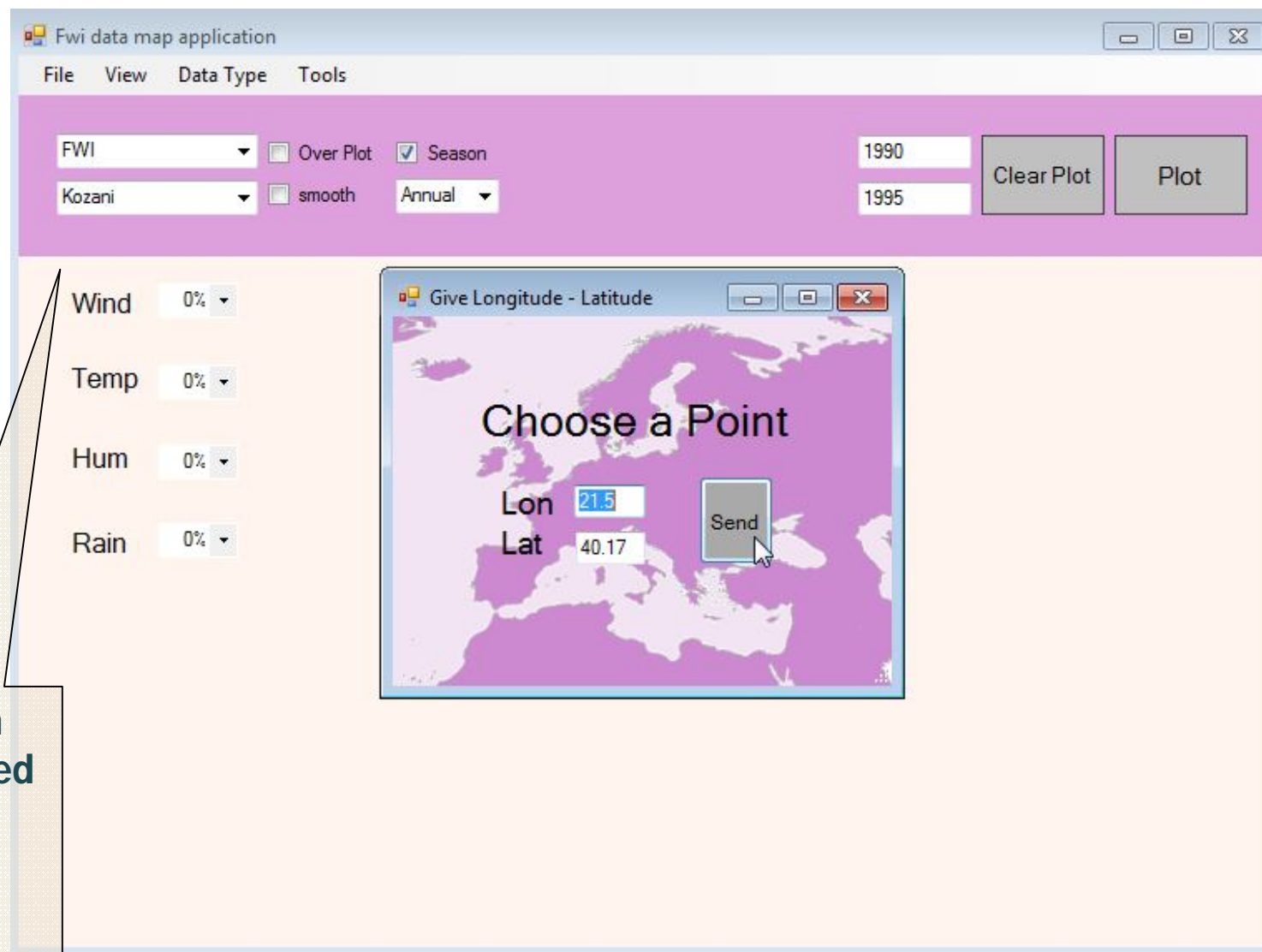
ind 1:fwi Kozani (emy)

| YEAR | MO | DY | Tmax | Rain | Wind | Hum  | ind 1 |
|------|----|----|------|------|------|------|-------|
| 1960 | 1  | 1  | 1.5  | .0   | 13.3 | 69.1 | 0.61  |
| 1960 | 1  | 2  | 1.5  | .0   | .0   | 79.6 | 0.56  |
| 1960 | 1  | 3  | 2.1  | .0   | .0   | 91.7 | 0.50  |
| 1960 | 1  | 4  | 3.0  | 2.5  | 6.0  | 92.1 | 0.46  |
| 1960 | 1  | 5  | .9   | .3   | 20.7 | 91.3 | 0.54  |
| 1960 | 1  | 6  | 1.4  | .0   | 8.0  | 84.6 | 0.61  |
| 1960 | 1  | 7  | -1.1 | .8   | 29.3 | 85.4 | 0.44  |
| 1960 | 1  | 8  | -1.4 | .0   | .0   | 75.7 | 0.56  |
| 1960 | 1  | 9  | .2   | .0   | .0   | 86.1 | 0.98  |
| 1960 | 1  | 10 | 5.2  | .3   | .0   | 93.8 | 0.67  |
| 1960 | 1  | 11 | 6.1  | 9.1  | .0   | 96.0 | 0.50  |
| 1960 | 1  | 12 | 7.3  | 2.3  | 6.0  | 91.3 | 0.52  |
| 1960 | 1  | 13 | 5.4  | .0   | 4.7  | 69.5 | 0.65  |
| 1960 | 1  | 14 | 3.8  | .0   | 4.7  | 78.2 | 0.61  |
| 1960 | 1  | 15 | 2.0  | .0   | 1.0  | 72.4 | 0.58  |
| 1960 | 1  | 16 | 1.0  | 2.8  | 3.0  | 97.4 | 0.78  |
| 1960 | 1  | 17 | 4.5  | 3.5  | .0   | 89.5 | 0.62  |
| 1960 | 1  | 18 | 5.4  | 11.5 | 6.0  | 88.0 | 0.69  |
| 1960 | 1  | 19 | 1.8  | .4   | 11.3 | 80.7 | 0.86  |
| 1960 | 1  | 20 | 3.5  | .0   | .0   | 75.1 | 0.61  |
| 1960 | 1  | 21 | 3.3  | .0   | 9.7  | 76.8 | 0.58  |
| 1960 | 1  | 22 | -.2  | .0   | 16.0 | 69.7 | 0.41  |
| 1960 | 1  | 23 | -.8  | .0   | 4.7  | 69.3 | 0.55  |
| 1960 | 1  | 24 | .2   | .0   | .0   | 81.3 | 0.56  |
| 1960 | 1  | 25 | .5   | .0   | .0   | 81.1 | 0.98  |
| 1960 | 1  | 26 | 2.2  | .0   | .0   | 86.4 | 0.75  |
| 1960 | 1  | 27 | 7.0  | .0   | .0   | 72.9 | 0.76  |
| 1960 | 1  | 28 | 10.2 | .0   | .0   | 58.4 | 0.64  |
| 1960 | 1  | 29 | 11.1 | .0   | 3.0  | 39.3 | 1.00  |
| 1960 | 1  | 30 | 9.6  | .0   | 4.7  | 34.6 | 1.45  |
| 1960 | 1  | 31 | 6.8  | .0   | 14.0 | 64.3 | 1.03  |
| 1960 | 2  | 1  | .5   | .0   | 26.7 | 73.5 | 1.19  |
| 1960 | 2  | 2  | -6.2 | .0   | 20.3 | 56.5 | 1.09  |
| 1960 | 2  | 3  | -5.9 | .0   | 5.3  | 56.7 | 1.21  |
| 1960 | 2  | 4  | -4.9 | .0   | .0   | 56.7 | 0.91  |
| 1960 | 2  | 5  | -5.6 | .2   | .0   | 94.5 | 0.97  |
| 1960 | 2  | 6  | -5.1 | .0   | .0   | 93.0 | 1.45  |
| 1960 | 2  | 7  | -2.9 | .0   | .0   | 96.1 | 1.54  |
| 1960 | 2  | 8  | -1.8 | .0   | .0   | 94.1 | 1.53  |
| 1960 | 2  | 9  | -2.0 | .0   | .0   | 97.0 | 1.51  |





# Software tool for Fire Weather Index Using Station/model Data



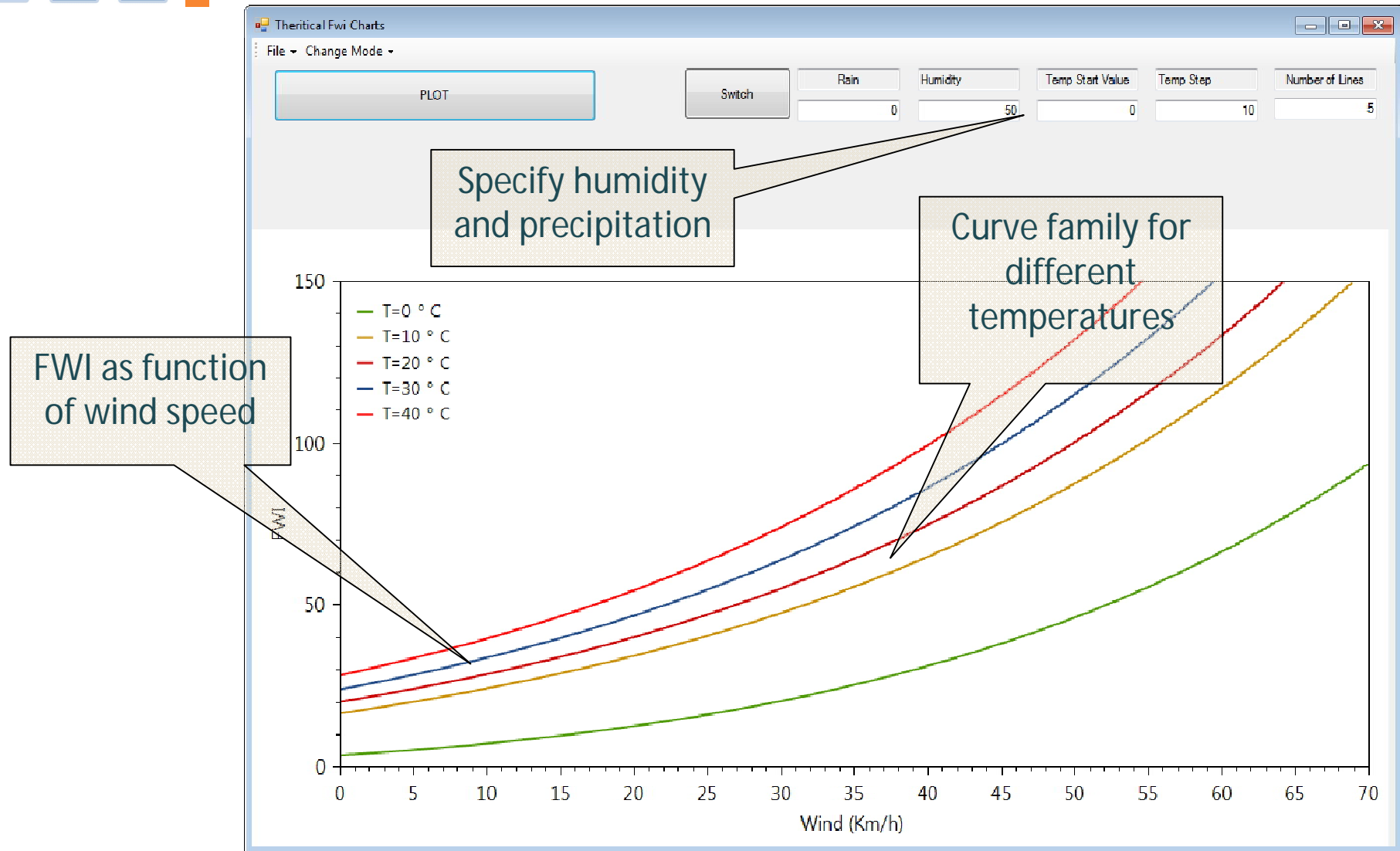
Live plot with  
model or gridded  
obs datasets  
(under  
construction)





# Educational tool for Fire Weather Index

## Studying the FWI sensitivity

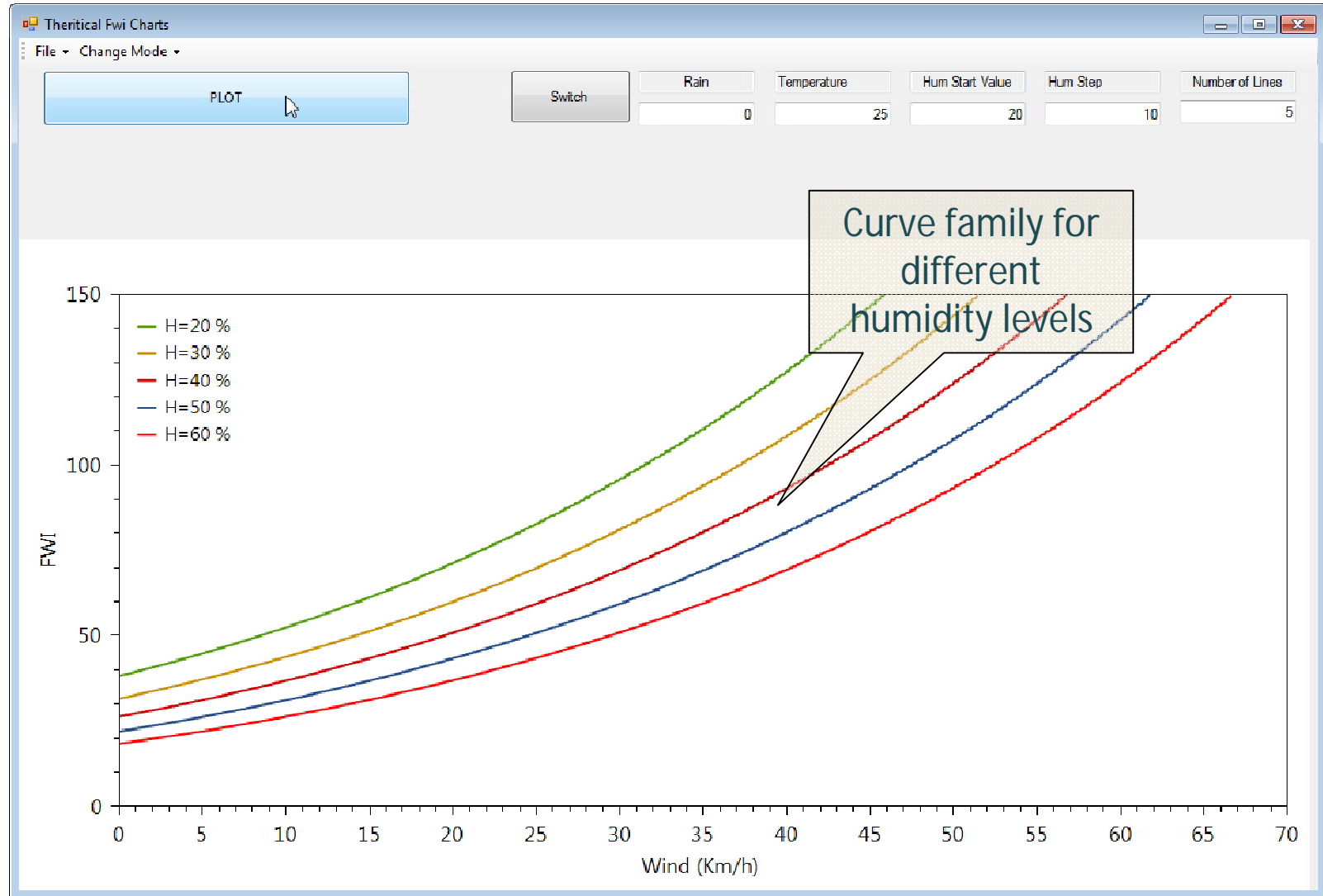






# Educational tool for Fire Weather Index

## Studying the FWI sensitivity

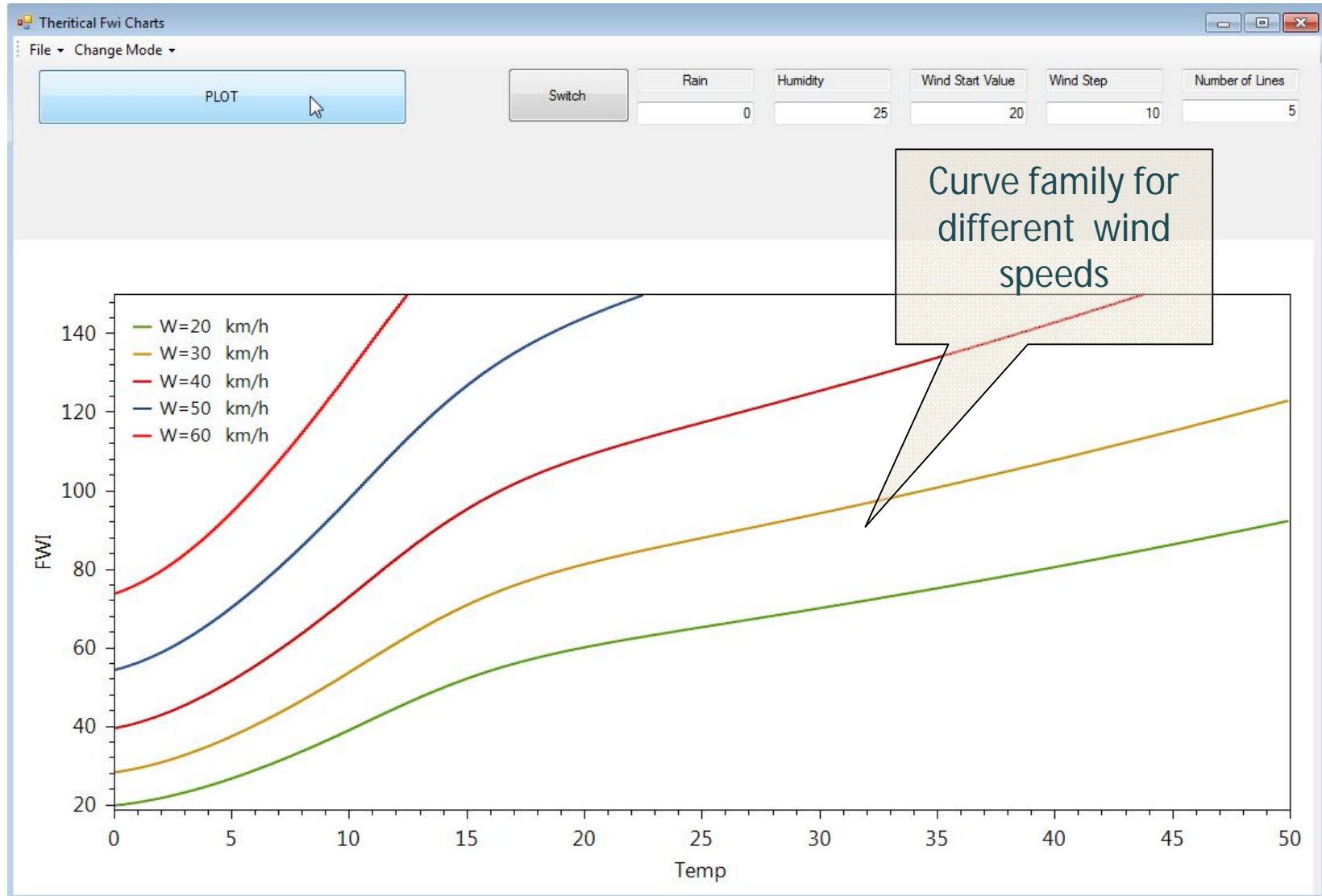






# Educational tool for Fire Weather Index

## Studying the FWI sensitivity







# Educational tool for Fire Weather Index

## Studying the FWI sensitivity

Export  
calculated  
indices in  
data files

fw\_i\_output.txt - WordPad

| Wind | T=0  | T=10  | T=20  | T=30  | T=40  |
|------|------|-------|-------|-------|-------|
| 0    | 3.65 | 16.61 | 20.27 | 24.06 | 28.48 |
| 0.1  | 3.68 | 16.67 | 20.34 | 24.14 | 28.57 |
| 0.2  | 3.71 | 16.74 | 20.41 | 24.22 | 28.67 |
| 0.3  | 3.74 | 16.8  | 20.48 | 24.3  | 28.77 |
| 0.4  | 3.77 | 16.87 | 20.55 | 24.39 | 28.86 |
| 0.5  | 3.8  | 16.94 | 20.63 | 24.47 | 28.96 |
| 0.6  | 3.83 | 17.01 | 20.7  | 24.56 | 29.06 |
| 0.7  | 3.86 | 17.08 | 20.78 | 24.64 | 29.16 |
| 0.8  | 3.89 | 17.15 | 20.85 | 24.73 | 29.26 |
| 0.9  | 3.92 | 17.22 | 20.92 | 24.81 | 29.36 |
| 1    | 3.95 | 17.29 | 21    | 24.9  | 29.46 |
| 1.1  | 3.98 | 17.36 | 21.07 | 24.99 | 29.56 |
| 1.2  | 4.01 | 17.43 | 21.15 | 25.08 | 29.66 |
| 1.3  | 4.04 | 17.5  | 21.23 | 25.16 | 29.76 |
| 1.4  | 4.07 | 17.57 | 21.3  | 25.25 | 29.86 |
| 1.5  | 4.1  | 17.64 | 21.38 | 25.34 | 29.96 |
| 1.6  | 4.14 | 17.71 | 21.46 | 25.43 | 30.07 |
| 1.7  | 4.17 | 17.78 | 21.53 | 25.52 | 30.17 |
| 1.8  | 4.2  | 17.85 | 21.61 | 25.61 | 30.27 |
| 1.9  | 4.23 | 17.92 | 21.69 | 25.69 | 30.37 |
| 2    | 4.26 | 18    | 21.76 | 25.78 | 30.48 |
| 2.1  | 4.3  | 18.07 | 21.84 | 25.87 | 30.58 |
| 2.2  | 4.33 | 18.14 | 21.92 | 25.96 | 30.68 |
| 2.3  | 4.36 | 18.21 | 22    | 26.05 | 30.79 |
| 2.4  | 4.39 | 18.28 | 22.08 | 26.14 | 30.89 |
| 2.5  | 4.43 | 18.36 | 22.16 | 26.24 | 31    |
| 2.6  | 4.46 | 18.43 | 22.24 | 26.33 | 31.1  |
| 2.7  | 4.49 | 18.5  | 22.32 | 26.42 | 31.21 |
| 2.8  | 4.53 | 18.58 | 22.4  | 26.51 | 31.31 |
| 2.9  | 4.56 | 18.65 | 22.48 | 26.6  | 31.42 |
| 3    | 4.59 | 18.72 | 22.56 | 26.69 | 31.53 |
| 3.1  | 4.63 | 18.8  | 22.64 | 26.79 | 31.63 |
| 3.2  | 4.66 | 18.87 | 22.72 | 26.88 | 31.74 |
| 3.3  | 4.69 | 18.95 | 22.8  | 26.97 | 31.85 |
| 3.4  | 4.73 | 19.02 | 22.88 | 27.07 | 31.95 |
| 3.5  | 4.76 | 19.09 | 22.96 | 27.16 | 32.06 |
| 3.6  | 4.8  | 19.17 | 23.04 | 27.25 | 32.17 |
| 3.7  | 4.83 | 19.24 | 23.12 | 27.35 | 32.28 |
| 3.8  | 4.87 | 19.32 | 23.21 | 27.44 | 32.39 |
| 3.9  | 4.9  | 19.39 | 23.29 | 27.54 | 32.5  |
| 4    | 4.94 | 19.47 | 23.37 | 27.63 | 32.6  |
| 4.1  | 4.97 | 19.55 | 23.45 | 27.73 | 32.71 |
| 4.2  | 5.01 | 19.62 | 23.54 | 27.82 | 32.82 |
| 4.3  | 5.04 | 19.7  | 23.62 | 27.92 | 32.93 |
| 4.4  | 5.08 | 19.77 | 23.7  | 28.01 | 33.05 |
| 4.5  | 5.11 | 19.85 | 23.79 | 28.11 | 33.16 |
| 4.6  | 5.15 | 19.93 | 23.87 | 28.21 | 33.27 |
| 4.7  | 5.18 | 20    | 23.96 | 28.3  | 33.38 |



## Conclusions

- Provision of short term fire risk forecasts for 3 days to address the needs of short term fire planners
- Provision of long term fire risk and other fire related indices changes due to climate change (time horizon up to 2050 and up to 2100) to address the needs of long term fire policy makers
- Provision of 2 software tools to enable calculation of fire risk using own data from observations/models and to explore the sensitivity of FWI with meteorological parameters