MSc Data Science

DATA VISUALIZATION

3rd Assignment

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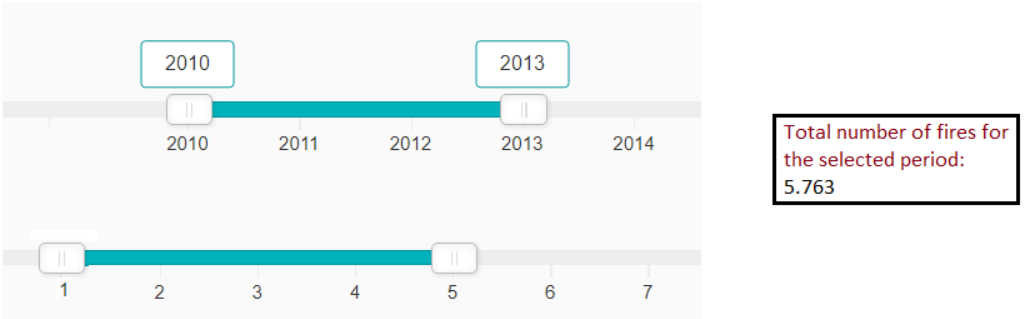
Introduction

The aim of this assignment is to design some visualizations with interaction capabilities, using the dataset that contains information about fires in Greece.

For the purpose of this assignment I used the Microsoft Paint software and have made 7 visualizations.

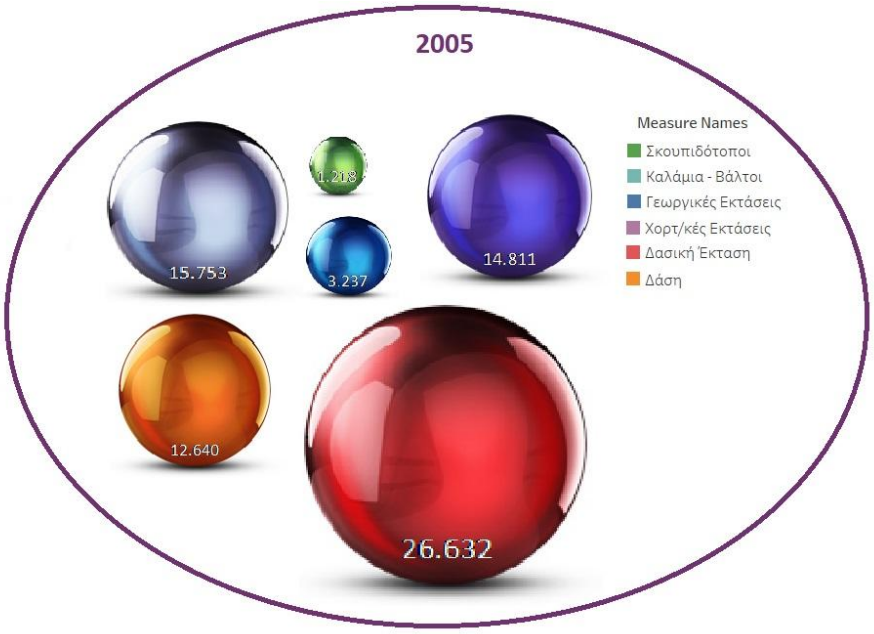
Visualizations

I. The first visualization presents the number of fires that occurred in a certain period. The user can define the period of interest, by using the range sliders as shown in picture below. The first range slider concerns the year and the second the month. If a specific year's and month's sum of fires needs to be shown then the sliders can be moved to the same year and same month. As the sliders are being moved by the user, the fire icons "fill" and "empty" accordingly with regards to the number of the events of fire. There is also a legend box, which shows the exact number of the events. A snapshot of the visualization is shown below. The added value of this visualization is that the user can get knowledge of the events of fires for the time period of his choice.

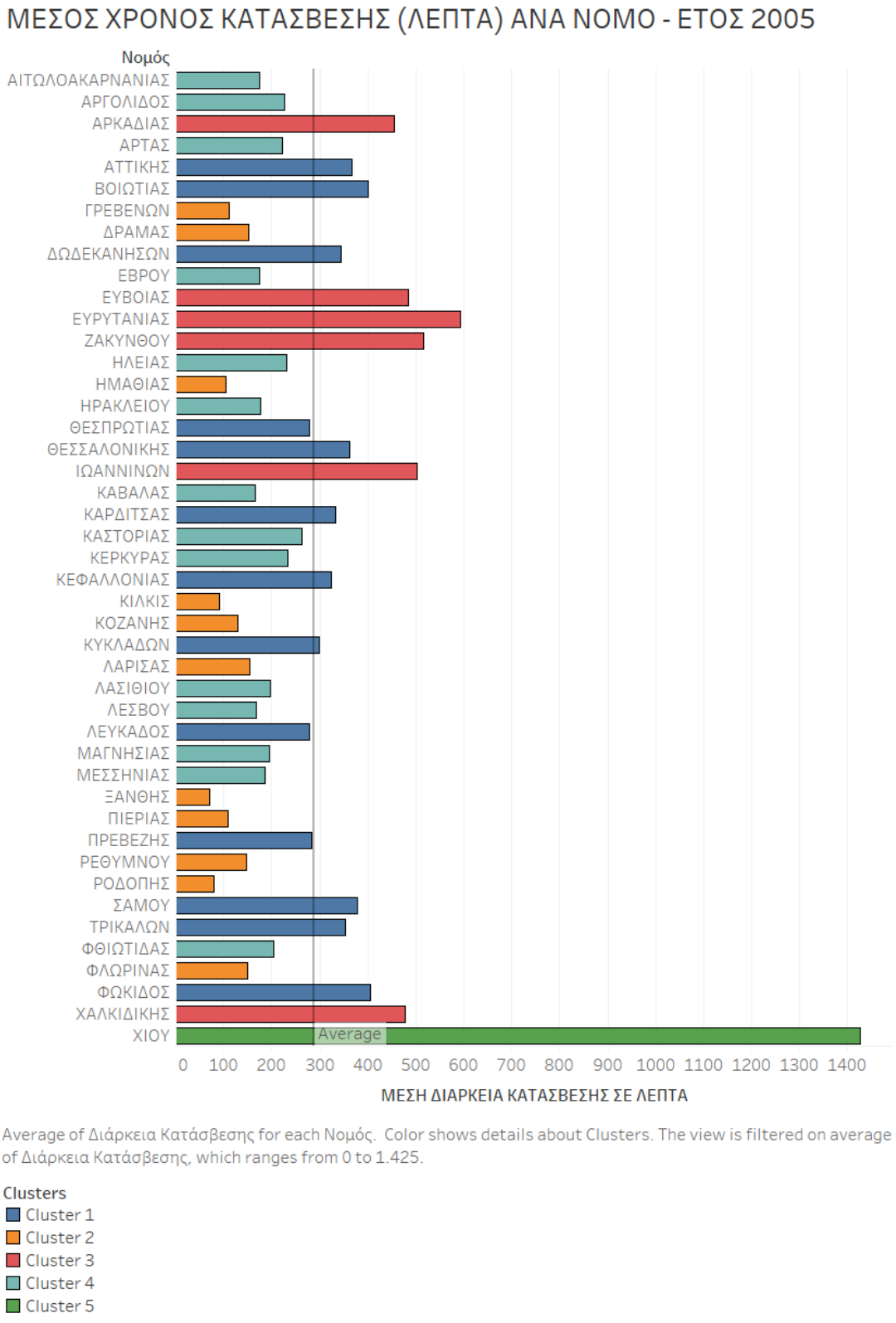


II. The second visualization presents the summation of the area (in acres) that was burnt, in relation to the type of the area for each year. So, the visualization starts with a number of 3D balls as shown below, each representing a year. The size of the balls represents the size of the total area that was burnt each year proportionally.

When the user moves the cursor on a ball, the arrow changes into a pink little hand to show that someone can interact with the ball. With drag and drop, someone can rearrange the position of the balls to bring one closer and have a better look. Then, by double-clicking on a ball, the visualization "moves" towards the chosen ball, like zooming into it. The next screen again shows some balls that presents each type of the burnt area. The balls' color represents the different types of area that was burnt and their size, the size of the area proportionally. A number on each ball indicates the number of acres that were burnt. Again, someone can rearrange the balls with the drag and drop option. A snapshot of the visualization is shown below. By double-clicking on this last visualization, the starting page appears, for the user to explore other years. The added value of this visualization is that the user can choose to get knowledge of a specific year's information and have a general idea of the proportions of the burnt area easily.



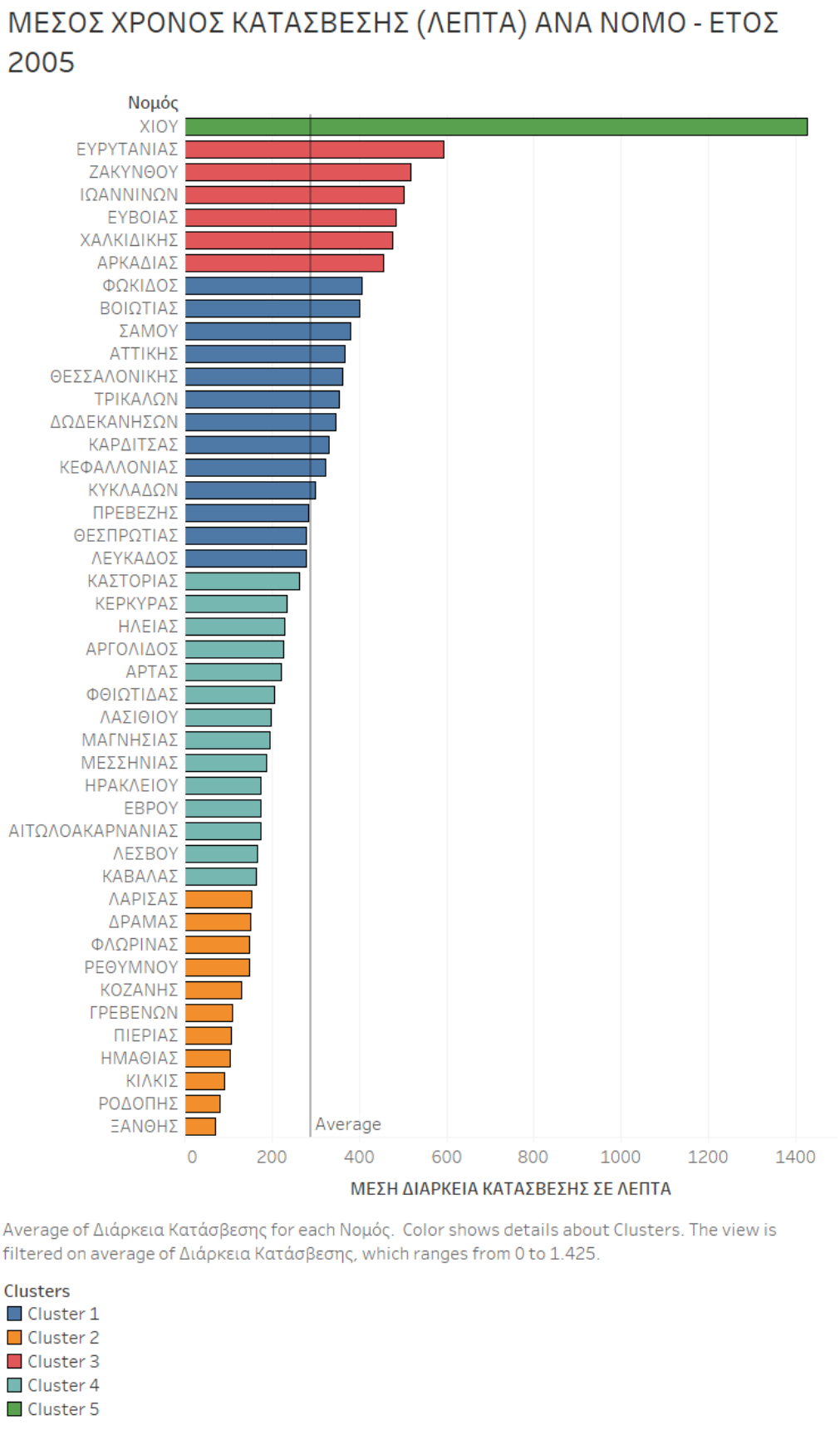
III. The third visualization presents the average time (in minutes) that was consumed for the fires to be extinguished, at each region of Greece. The user has the ability to click on a bar of the bar chart and have the items of each cluster shown together or double-click on a bar to reorder the bars from the biggest to smallest and vice versa with each double-click. The indication that the bars are active is shown by highlighting them, when the mouse pointer is on them.



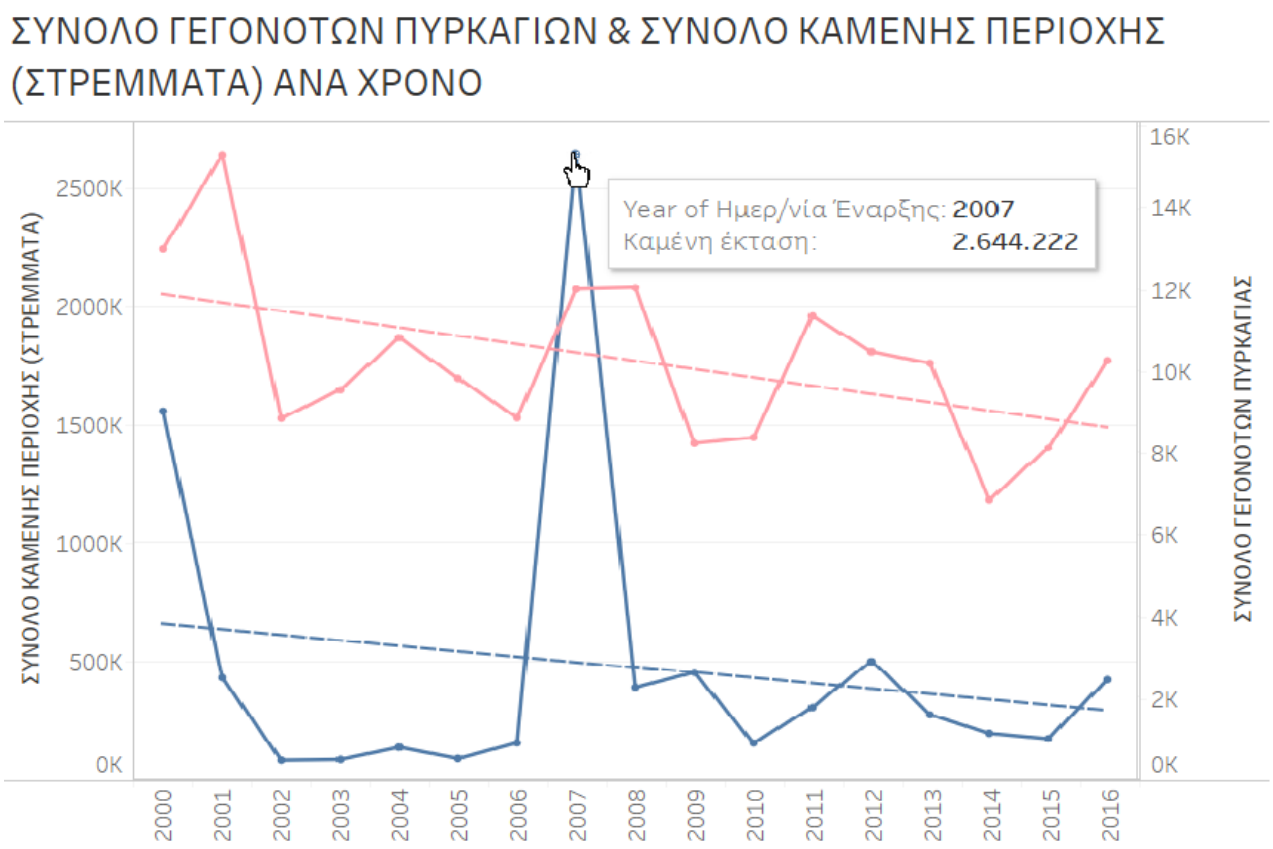
Average of Διάρκεια Κατάσβεσης for each Νομός. Color shows details about Clusters. The view is filtered on average of Διάρκεια Κατάσβεσης, which ranges from 0 to 1.425.

Clusters
- Cluster 1
- Cluster 2
- Cluster 3
- Cluster 4
- Cluster 5

The bar chart would look like the one below when one of the above actions take place. The added value of the visualization is that the user can rearrange the bars in a way which is more convenient for him to extract some knowledge about the regions.



IV. The forth visualization is a dual axis plot that presents both the summation of the burnt area along with the number of fires that have occurred in each year. The user can hover over the chart and where the mouse pointer turns into a hand, a box appears with information about the specific point on the chart as shown in the chart below. The user can also click on the points and the information is gathered in a table below, for him to be able to make comparisons with the numerical data. The added value of this visualization is that the user can have the knowledge of the exact events that have occurred and that he can make the comparisons.



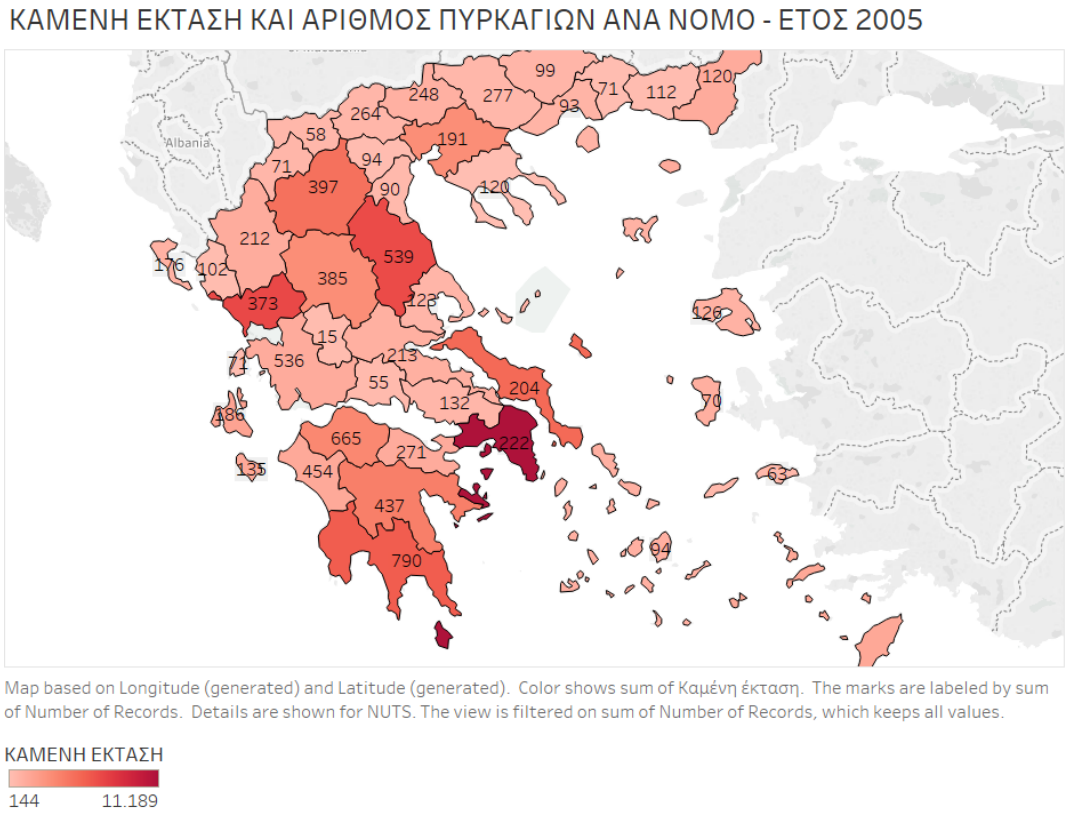
The trends of Καμένη έκταση and Γεγονότα πυρκαγιάς for Ημερ/νία Έναρξης Year. Color shows details about Καμένη έκταση and Γεγονότα πυρκαγιάς.

Legend
- Γεγονότα πυρκαγιάς
- Καμένη έκταση

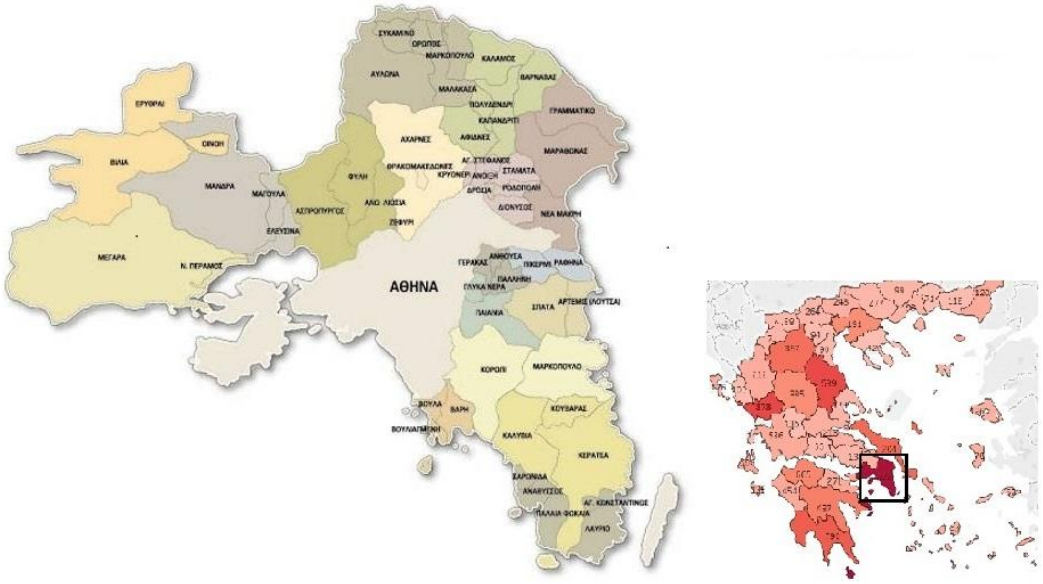
Table of Comparison

Year of Ημερ/νία Έναρξης:	2005	Year of Ημερ/νία Έναρξης:	2010
Γεγονότα πυρκαγιάς:	9.828	Γεγονότα πυρκαγιάς:	8.389
Καμένη έκταση:	88.734	Καμένη έκταση:	152.303

V. The fifth visualization presents the summation of the burnt area along with the number of events of fire for the year 2005 on a spatial chart (map of Greece). The shade of the color of the regions represents the size of the area in acres that was burnt and the number on each region represents the number of the fires that have occurred. The user can mark a rectangle area with the mouse and this specific area would come closer and show the same information, this time for the specified area.

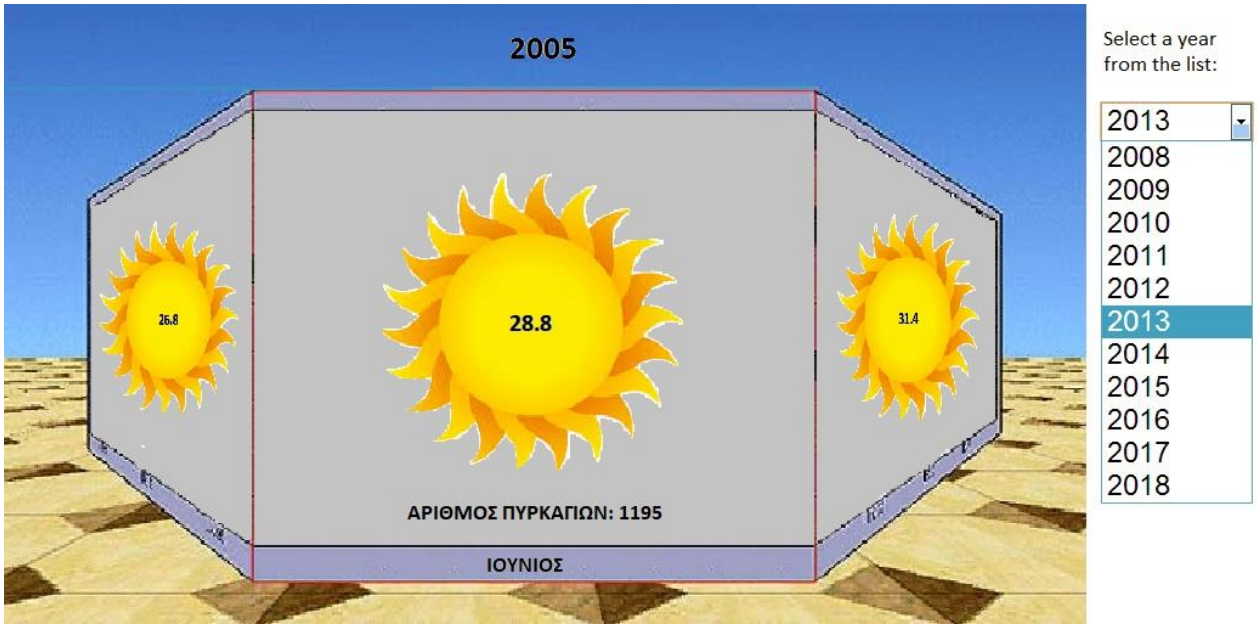


For example, if someone chooses the area of Attica, the map would become something like the one shown below (with the right colors and numbers on the map). The user can also have the ability to move the rectangle on the little map to see other areas nearby and also to return to the whole map with double-clicking anywhere. The added value of this visualization is that the user can explore a smaller area of the map and have additional area-based information.

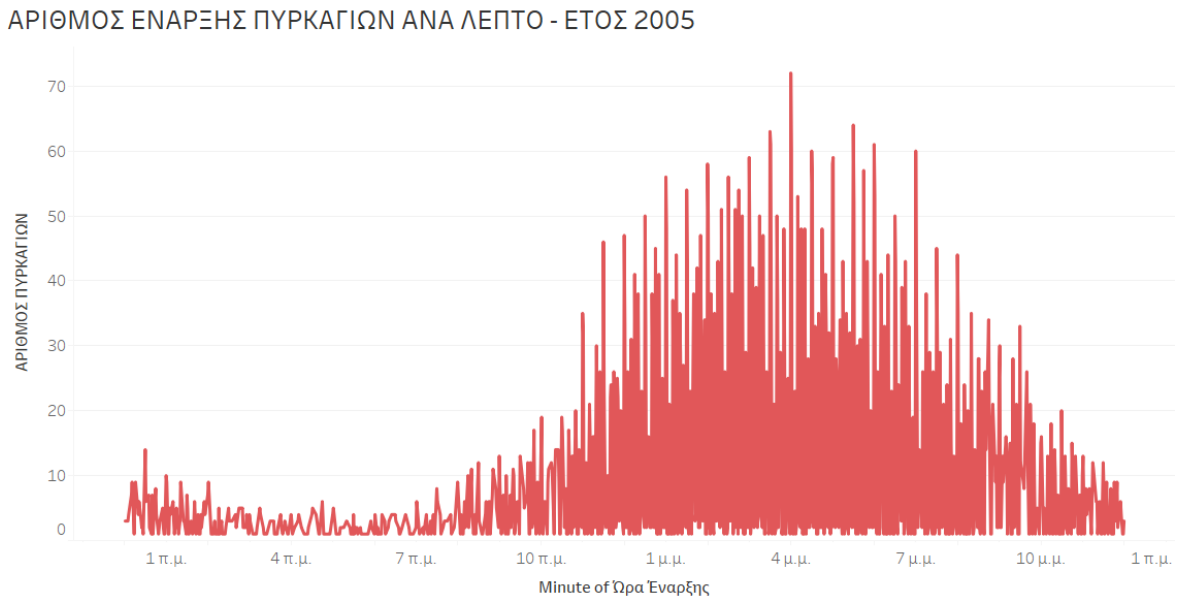


VI. The sixth visualization presents the number of events of fire in relation to the average maximum temperature in Greece for each month of the year, in a bifocal display as shown below. The user can choose a year from the drop list and the bifocal display for this specific year is shown in the screen. The size of the sun in the display is bigger when the temperature is higher which is shown as the number in the sun. The number of fires is shown under the sun icon.

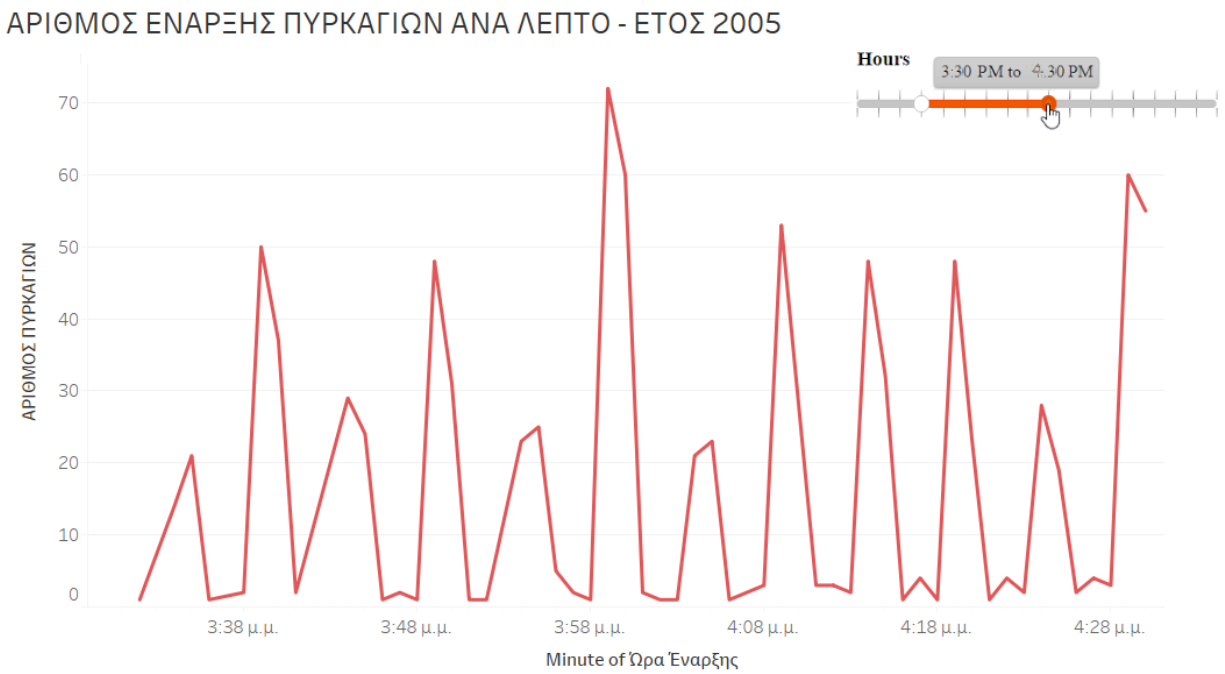
Then, the user can "grab" a side of the bifocal display and "drag" it to the left or right revealing the next or previous month of the year along with the information about the number of fires in regard to the average temperature. In a smartphone or a tablet one can just swipe the screen to get the previous or next month. A snapshot of the visualization is shown below. The added value of this visualization is that the user can choose a specific year and by using an interesting interaction explore each month's relevant information.



VII. The seventh visualization presents the number of the fires in relation to the moment of the day that they started (shown in minutes). The user can choose a specific range in time with the range slider as shown below and the chart will present the information for the specified range. The user can also slide the chart to the left or to the right to reveal the information that is near. The added value of this visualization is that the char becomes more comprehensible by showing detailed information.



The trend of sum of Number of Records for Ώρα Έναρξης Minute.



The trend of sum of Number of Records for Ώρα Έναρξης Minute.