

**Plastiras Lake: influence of the relief on the revelation of the water presence****G.-F. Sargentis<sup>1</sup>, K. Hadjibiros<sup>2</sup>, I. Papagiannakis and E. Papagiannakis<sup>3</sup>**

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**EXTENDED ABSTRACT**

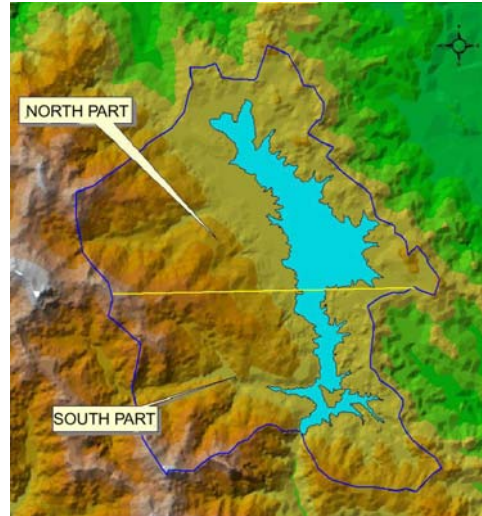
The Plastiras Lake is an artificial reservoir, constructed for hydroelectric use and noticed for its beautiful scenery. The landscape is dominated by the presence of water, which constitutes a pleasant aesthetic target that attracts the observer and can therefore be determined as a magnetic focus point. The lake is a typical surrounded landscape, with high mountains at a small distance from the water, as a result of the steep riparian contours. This is a common characteristic of mountain artificial lakes, where the scenery is usually considered to be superior to that of natural lakes. The landscape morphology also affects the observation of the magnetic focus point, which differs in the northern and the southern side of the Plastiras Lake. In the north, the slopes are smooth and the magnetic focus is weak, whereas in the south the landscape elements are clearly distinguishable and apprehensible. For the same reasons the axes composing the landscape in the southern part are more intense than in the northern part. As a matter of fact, on each side of the lake, the landscape relief plays a different role in assisting the revelation of the magnetic focus point to the observer. The observation gravity circles are a tool that can be used in order to obtain a qualitative assessment of the intensity of revelation of the magnetic focus point. The circle size is relative to the distance from the subject and is also greatly affected by the relief. It must be taken into account however, that aesthetic elements such as the revelation of the magnetic focus can not be quantified.

**Key words:** Plastiras, landscape, aesthetic, observe, circle

## 1. INTRODUCTION

The Plastiras Lake is an artificial lake in Central Greece constructed in 1959. The concept of the specific dam construction was the production of electricity and the irrigation of the Thessalic Plain [1]. Not long after its construction the beauty of the new landscape became part of different studies concerning the lake [2,3,4,5].

The Plastiras Lake landscape can be generally separated in two parts, the northern and southern (Figure 1), which have a totally different morphology. The northern part resembles a natural lake whereas in the south the landscape is closer to that of an artificial lake. The latter may surprise the observer who is not used to it [6]. Through the attempt to evaluate the differences in the landscape, and due to the change of the water level the southern part of the lake was considered more interesting than the northern part in terms of landscape quality. The above phenomenon is discussed and interpreted in the present paper.



**Figure 1:** The northern and southern part of the lake

## 2. METHODOLOGY

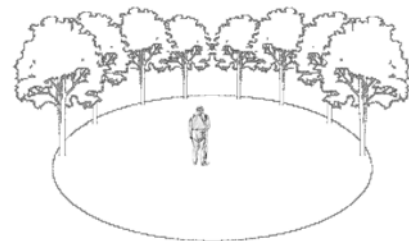
### 2.1 Creating a new research tool

According to J. Appleton, the focus point is defined as the part of the landscape which is distinguished in terms of texture, color or size. Magnetic focus is defined as the part of the landscape which has the characteristics of a focus point and is also a pleasant aesthetic target. A magnetic focus attracts the observer [7,8].

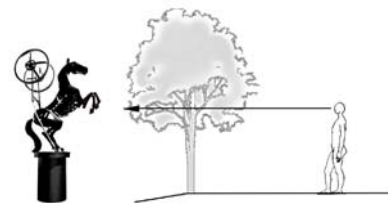
We often see magnetic focus points in landscapes. Focus points can be a statue, a big tree, a beautiful house. Water is a common magnetic focus in landscapes. Water attracts the observer and it is one of the most clear magnetic focuses we can observe [9].

A magnetic focus can be perceived in different ways. One observer can see the magnetic focus without any barrier or filter in one part of the landscape, but he can also see the magnetic focus with many barriers or filters [7].

If an observer beholds the magnetic focus without any barrier or filter then the magnetic focus is revealed intensively. This becomes even stronger if the landscape is surrounded (Figure 2) [10]. A surrounded landscape is a place which has frames at the margins of the observation field. Surrounded landscapes act as a side blinder to the



**Figure 2:** Position of the observer inside a surrounded landscape



**Figure 3:** Barriers between the observer and the magnetic focus (sculpture)

observer. Therefore it is more effective to put a magnetic focus, as for example a sculpture, inside a surrounded landscape than in an open landscape [11].

Surrounded landscapes are very sensitive to alterations. It is therefore inconvenient for the observer to have barriers or filters between him and the magnetic focus of the landscape [12] (Figure 3).

If there is a magnetic focus in the landscape we have to examine how this magnetic focus can be cognizable from different locations. This depends on the distance, the barriers, and on the filters located between the magnetic focus and the observer. So, if we have a magnetic focus without any barrier, for a specific position of the observer this magnetic focus will transpire to the observer intensively (Figure 4a). On the other hand, a magnetic focus with barriers or filters will transpire to the observer weakly (Figure 4b)

If we take a linear section from the point of observation to the point of the magnetic focus, then every point of the line corresponds to a different intensity of revelation of the magnetic focus. The circle having the point of magnetic focus as its centre and radius relative to the tension created by the point of magnetic focus can be defined as an Observation Gravity Circle (O.G.C).

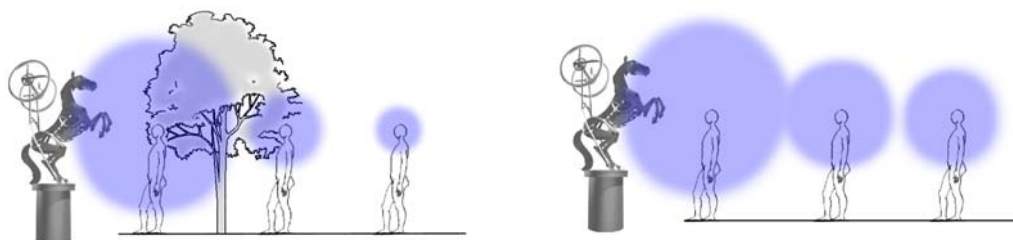
## 2.2, Observation Gravity Circle (O.G.C)

As seen previously, the observer of a landscape may focus on the magnetic focus point weakly or strongly [13, 14].

If we have a sculpture and an observer, we can present the Observation Gravity Circle O.G.C. (Figure 5). Each O.G.C. shows how the magnetic focus manifests itself in each point of the section of the landscape. The diameter of the O.G.C. describes the intensity with which the landscape magnetic focus point is revealed. This intensity varies for the different parts of the landscape and the difference in intensity corresponds to a change in the diameter of the O.G.C.



**Figure 4:** Example of barrier between the observer and the magnetic focus



**Figure 5:** Example of observation gravity circle

In Figure 5 O.G.C. shows the intensity of the sculpture for each position of the observer. At increasing distances the O.G.C. becomes smaller because the observer can not distinguish the details and the form of the magnetic focus. So the distance acts as a filter between the magnetic focus and the observer. A cloudy atmosphere could also be a

similar filter. In the same figure a tree would be a break between the magnetic focus and the observer. Behind the tree the O.G.C. would exhibit a rapid decrease as the magnetic focus is less clear to the observer.

Based on the above examples, it can be argued that the case with the tree is “weaker” than the one without the tree because in the latter the observer cannot see the magnetic focus clearly.

Using the O.G.C. it becomes easier to conclude that the landscape in one part of the lake is more beautiful than in the other part. It can also be shown that the magnetic focus of the landscape is more noticeable and apparent (more emphasized) in specific parts of the landscape.

### 3. RESULTS

#### 3.1 Defining the research field

The Plastiras Lake landscape is strongly characterized by the water, which is the dominant element of magnetic focus. The Plastiras Lake is a typical surrounded landscape. Similar landscapes can be found in other places on the Agrafa mountains, however, the landscape of the Plastiras Lake is more interesting than the rest due to the presence of water, which is a strong and dominant element of magnetic focus [7, 8] (Figure 6).

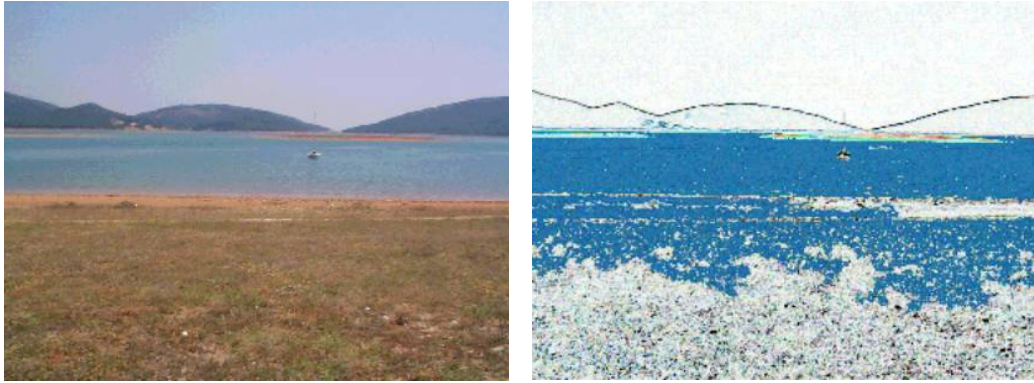
The morphology of natural lakes becomes smoother because of erosion. Due to this phenomenon in a natural lake landscape, the surrounding mountains are typically found at a distance from the water. In contrast, in an artificial lake landscape, because of the steep contours of the shore, one can observe the mountains and the water simultaneously, while the water, being the element of magnetic focus is more clearly defined. Therefore it can be said that the landscape of the Plastiras Lake is superior to that of a natural lake.



**Figure 6:** Comparison between similar cordon landscapes with and without the lake.

#### 3.2 Characteristics of the north and south parts of the lake

When slopes are small, the change of the lake water level reveals a big part of the dead zone. Through the observation of the water limit, and the use of digital imaging, it can be seen that the dead zone in the area at the northern part of the lake merges with the water and the image becomes confusing (Figure 7).



**Figure 7:** The lines in the north part of the landscape



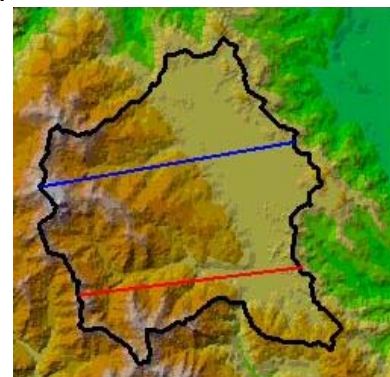
**Figure 8:** The lines in the south part of the landscape

On the contrary, such issues do not appear in the southern part of the lake, where the different landscape elements are clearly distinguishable and apprehensible (Figure 8). The landscape morphology affects the observation of the landscape magnetic focus point.

The morphology of the landscape is a major factor for its viewing. To examine this factor we use two GIS sections in the north and south part of the landscape (Figure 9). The geometry of the landscape shows that the axes composing the landscape in the south part of the lake are very intense, while the axes composing the landscape in the north part of the lake do not have the same emphasis [13].

The relevant sections are seen in Figures 10 and 11 in blue and red for the section in the northern and southern part of the lake relatively. Each section shows the landscape relief on the specific line (x axis: length and y axis: height). To make the differences in landscape morphology more obvious each length unit corresponds to ten height units:  $X/\Psi = 1/10$

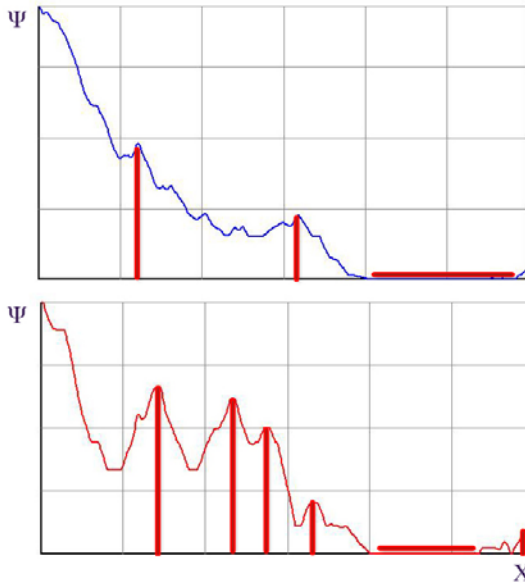
From Figure 10 it is obvious that the southern part of the landscape is surrounded and surrounds the lake more strongly than the northern part of the landscape which is more “open”. In Figure 11 the effective areas of the longitudinal section are defined and shown in red. These are the places from where one may observe the magnetic focus point of the landscape.



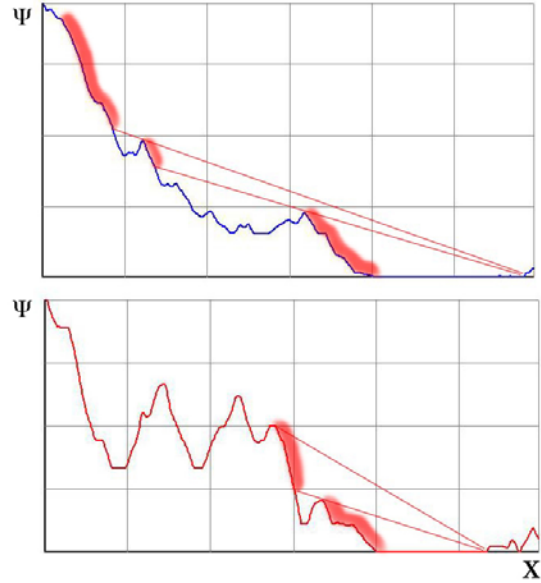
**Figure 9:** North and south part sections of the landscape

The examination of these areas indicates an ease to observe the magnetic focus point in the southern part, since the relief creates there a guide in the landscape axes towards the water. This works as a side blinder for the observer, and therefore assists the observation of the landscape.

Concerning the magnetic focus point observation angles, it is obvious that these are smoother in the northern part, where the observation lines are almost parallel to the level of observation. Consequently, the observation object appears less dramatic in the northern part of the landscape because many breaks can be found between the observer and the magnetic focus.



**Figure 10:** The basic axis directions. The blue line is the northern section and the red line is the southern section ( $X:\Psi=1/10$ ).

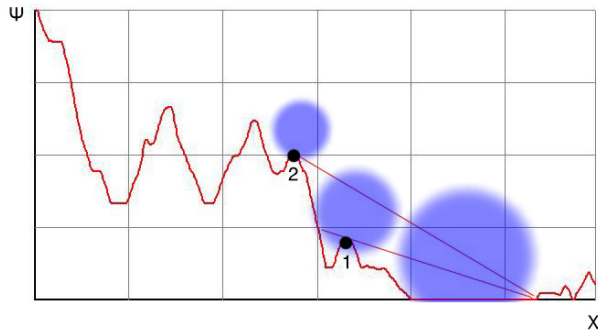


**Figure 11:** The axis of limit observation. The blue line of the section is the northern section and the red line of the section is the southern section ( $X:\Psi=1/10$ ).

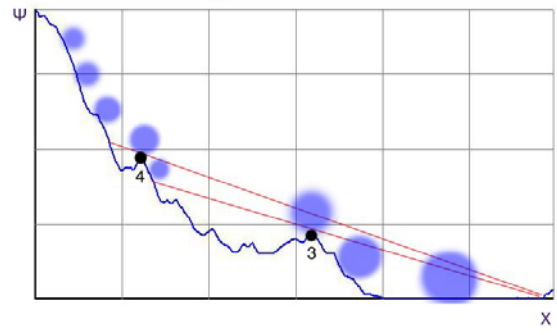
From the above it can be concluded that the landscape relief assists the revelation of the magnetic focus point to the observer and in the north part of the lake there are more heavily confined.

### 3.3 Evaluation of the landscape by O.G.C.

Apparently, the circle size depends on the distance from the subject (the bigger the distance, the smaller the observation gravity circle). At the same time it is greatly affected by the relief. For example the dramatic fall or a sharp relief of a landscape increases the circle size (Figure 12, 13).



**Figure 12:** Observation gravity circle southern part ( $X:\Psi=1/10$ ).



**Figure 13:** Observation gravity circle northern part ( $X:\Psi=1/10$ ).



**Figure 14:** Position 1 (Figure 12)



**Figure 15:** Position 2 (Figure 12)



**Figure 16:** Position 3 (Figure 13)



**Figure 17:** Position 4 (Figure 13)

The tension of a magnetic focus point revelation is relevant to the size of the O.G.C at every section point. A landscape capturing the magnetic focus point, such as the one in the southern part of the Plastiras Lake, is the most effective in the revelation of a magnetic focus point (Figure 12, 13).

We can see that images of the southern part of the lake are very clear (Figure 14,15), on the other hand, images from the northern part of the lake are confusing as the water is not distinguished clearly (Figure 16,17), and the images have brakes on it (Figure 18).

#### 4. CONCLUSIONS

Landscape relief affects the revelation of the landscape magnetic focus point [15].

The emphasis of the landscape magnetic focus appearance depends on the morphology of the landscape.

Observing Gravity Circle is a tool which can be used to obtain a qualitative idea about the emphasis of the magnetic focus in the landscape.

Generally, elements such as the revelation of the magnetic focus point cannot be defined quantitatively. However, the

observation gravity circle makes it possible to interpret the change in the quality of a landscape. Where large and concentrated circles are found, a relative “projection” of the magnetic focus point is also to be found. On the contrary, where observation gravity circles are spread out, the quality of the landscape cannot reach such a high level.



**Figure 18:** Position 4 (red arrows shows image brakes)

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