Does the dynamic cartographic variables have interference on map reading? The case of variables shape and velocity into representations of weather phenomena variations.

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Abstract. The present study aimed to the analysis of two dynamic visual variables (shape and speed), through the analysis of climate animations, represented by the television network open, displayed to the public. The process went through steps such as image analysis, processing and application thereof to the public, which was divided into two distinct groups, applied together with a questionnaire. Thus came up with different answers, since the differentiation of audiences. We come finally to data analysis, where the two groups achieved through analysis differentiated formulate understandings about the issue.

Keywords: Dynamics maps, Cartographic Visualization, Visual Variables

1. INTRODUCTION

Based on the study of an animation climate from which to understand human cognition and understanding of the learning process of this animation, which corresponds to the time-space sequence of a climate phenomenon (here represented by the passage of atmospheric low pressure systems, our, cold fronts coupled primarily the highest concentration of any condition of clouds and rain).

We start from the point where individuals have different characteristics and, consequently, over time may capture and assimilate the information whether it is nature.

The starting point was the question of a dynamic representation available TV channels, offering viewers the weather forecast in a space of time, that this representation does not provide a critical scientific clash because the way it is represented to viewers.

He found himself in this regard an opportunity to address the issue differently in question which is: the passage of these atmospheric phenomena over a portion of the territory of South America and its understanding by the user.

Sequencing representation by means of the same dynamic animation, but in three different speeds, combined with a questionnaire where respondents opined their visual approaches, which would be evaluated and reproduced in the form of the object of study work.

2. BACKGROUND SHORT REVIEW

The abstraction process information primarily on geographic visualization, defined by MacEachren et. al. (1995) as the practical use of visual representations (whether paper, computer or other media) and, on the other hand, over time with the advancement of technology in the call display cartographic product computation.

> In cartography, computer technology introduced from ‘60s revolutionized the way you create, display and use maps. Early influences of computer technology were the mechanisms for the creation of the map, which were only used for static presentation of cartographic information (PETERSON, 1995, p.6) apud Maziero.

The maps over the decades by continuous techno-scientific revolution pass internship static (paper) for cartographic animations, which are sequences of images represented normally in the range spatiotemporal denoting the idea of a dynamic phenomenon. This same type of animation also receives other settings second MacEachren (1995), the map viewing or scientific visualization, which represents the portion of the map viewing technology.

When this evolution occurs by passing the “static’’ for the “dynamic" form together represent changes and the possibility that the wide dynamic possible by abstraction, our, the sequence of *frame* is capable of providing more a static method by which information was not possible.

Second Maziero (2007), the dynamic animation offers numerous possibilities to the user, requiring the user through another factor, interaction, further contributes to the success of a representation, although this item is not addressed in this study represents great difference in results.

The dynamic maps "looks" can be presented through animation, as the so-called "GIF" [8] animated.

[8] GIF (Graphics Interchange Format) is an image format that stores digital still images or simple animations for your exchange with other formats.

Ramos (2005) contend that a dynamic map and not just a sequence of images, but can also be understood through sound (recording) and other mechanisms (such as videos), depending on a lot of what the viewer will see, if possible withdraw more information.

Based upon this idea of abstraction higher possibility of cartographic information through animation, in this case the animated weather map, we chose to use in this way as a means of sample representation in order to better understand the behavior of dynamic visual variables before the interviewed.

3. MATERIALS AND METHODS

The work was based on a look at the mapping of climatology, when the principle of observing the weather, which are represented in different ways by the media to viewers.

We used similar representations to those TV channels also were using, trying to maintain a maximum degree of similarity, not matching the basic aspect of similarity.

Entered in the inquiry, that many people could not understand the sequence of satellite images available on the site CPTEC (Center for Weather Forecasting and Climate Studies), which are shown on television and in many cases were only understood by explanation of the presenter.

It was then proposed a sequence of frames to different people in order to understand what would be the point of divergence, where some users understood and others could not understand the same sequence of images shown on television.

It was necessary to provide some criterion, because of the dynamic maps allow greater abstraction and multiple information. She is manipulated in many cases, can occur where the interaction with the computer interfaces and interaction with the map itself, Maziero (2007). As the map can allow various interpretations, noting the interactive user-map we chose to not interact presented in sequence, which would have given us different data, but the images presented to respondents was not afforded this possibility by restricting the respondents to pre-selected images, without manipulation interface, only the interface map.

Satellite images were selected over a period of time that there was a significant atmospheric activity, always observing the availability of the electronic address of the Center for Weather Forecasting and Climate Studies (CPTEC), which are captured at intervals of 15 to 15 minutes by weather satellite.

We selected 20 sequential images and these images were handled by the video program Movie Maker, and set them to form three videos with different speeds, representing a slow passage with duration of 1 second for each frame, thus the duration of 20 seconds for all the process, the second sequence with the same 20 frames features 10 seconds, and 0.30 seconds for each frame sequence corresponding to median; finally leaving the slow speed with a total duration of 2 seconds to 20 frames, corresponding to these velocities are found the site (CPTEC), the palette of speed.

Was proposed a questionnaire with eight open questions related directly to changes in visual variables proposals (shape and velocity) occurring in sequence of frames.

Regarding the selection of respondents, no restrictions were made regarding gender, age, education or gender, all participated voluntarily.

> Were not taken into account gender differences to carry out activities with the maps, because you cannot say that the spatial abilities (orientation, visualization and spatial relationship) are better in men than in women, or the opposite (Montello et. al., 2002, p. 529 apud SANTIL 2008).

Another factor that was not observed in any interviewee was the difficulty of vision, usually because of age is common after 40 years in people of both sexes.

As a next step we have chosen the public it would appear, is a group of people with knowledge of the area (1 undergraduate and 1 graduate in Geography), and a second group with people without knowledge in the area (1 gastronome and 1 school complete).

The deployment environment was constant for all respondents, with no differences in means and method of deployment for not passed through to results.

4. CONCLUSION

Through the responses observed and harvested, were formulated patterns for the two groups of respondents.

To the layman group, it was difficult to identify the space as a territory in which the activities occurred atmospheric and abstract information was only possible with the same dynamic representation in very slow speed with longer duration between one frame and another, made to understand what was happening the unconscious use of partonomy, or the quantitative observation of objects in the animation, identified by them as moving clouds, not being able to describe the phenomena occurring in these spaces.

The group with expertise in the subject examined the elements differently, making use of taxonomy, analyzing the elements in a qualitative way.

They classified treat yourself to higher atmospheric phenomena and less intense as their intensity of color (from white to gray with) respectively, remembering that the whole process was monochrome.

The observers were able to identify the elements beyond the lay group identified (clouds), the dynamics of the interaction between space phenomena occurring with their greater or lesser intensity, and analyzed the visual variables (shape and velocity), and unwittingly answered processing the ideas of forms (which are answered by the clouds first group) and also the dynamics occurring through the observed velocity more effectively and data abstraction at fast speed.

The variable visual (form) was interpreted as being with this element of direct interference of the system undergoing changes over the distance traveled, and these changes occurred at all speeds, however, the relationship of the group that held the knowledge in the area was the highest speed just as effective visualization tool to visualize the interrelation between space-time and the dynamics of atmospheric events.

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