Between the Publication and Integrity - The issue of GI"Security" in Cultural Resource Management.

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Abstract: This paper shows an example application regarding the disclosure of our research project on ancient stone coffins in North and East Harima (播磨) (Hyogo prefecture, Japan). We collaborated with cultural resource management officers in local governments in North and East Harima. We have already published paper map of stone coffins from their data, but this map has functional limits for usage of positon data. Therefore, we decided to apply the Geographical Information System (GIS). However, the high resolution, large scale background map could possibly lead to some security problems for guarding the cultural heritage sites. To solve this problem, we considered four methods: showing the locations with relatively large markers, only providing the approximate address names without using markers, rounding off the coordinate values and ranging of the scales users can access so that they cannot reach the precise information. We discuss the reasonability of each methods depening on the case. Archaeologists and cultural resource management officers should regard this problem and these methods as an important issue. What must be avoided is putting the security of the cultural heritage sites in danger due to neglect of considering the importance of "G-I-Security".

Key words: Cultural Resource Management, Publication, GIS, Security

1 INTRODUCTION

In the project, we studied on stone coffins in the Kako (加古) basin made with Tatsuyama tuff stone (竜山石), which was used characteristically in the Kofun period. We collaborated with cultural resource management officers in local governments in North and East Harima. Upon our request, they chose about ten representative coffins from each city or town in those areas. The total number of coffins is 82. Our research outcomes have already been published in the form of a paper map titles "Cultural Heritage Map in the Kako Basin" (Fig.1). Our aim was to develop digital maps to

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contribute to volunteer activities. These will preserve cultural properties conducted by the local residents. However, we are facing several problems.

The paper map has the following functional limits: First, the positional information of the coffins is separate from their attribute information due to the layout of the map and as only one scale of a map is provided, users cannot switch to another scale when they desire. Also, we have to restrict the number of coffins to include depending on the size of the paper. Therefore, we decided to apply the Geographical Information System (GIS) to overcome these problems.

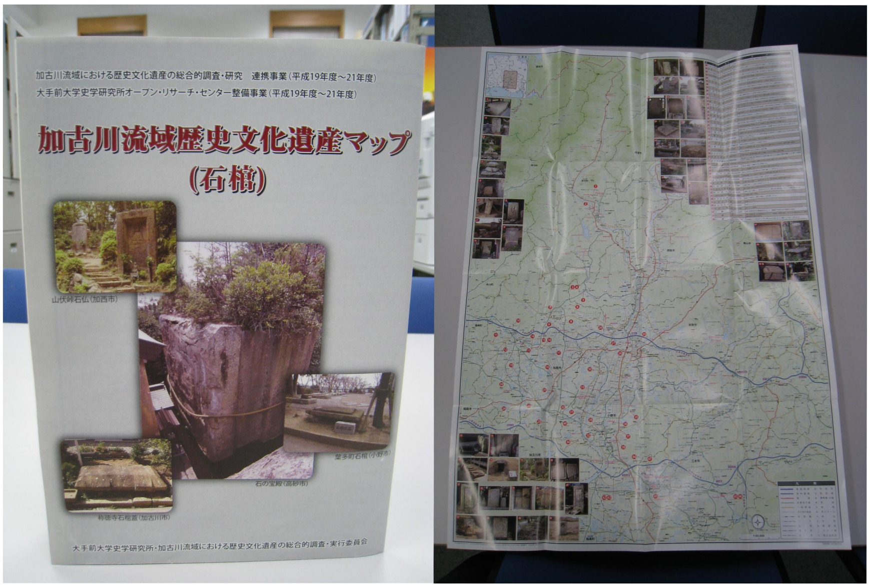

Fig. 1　Cultural Heritage Map in the Kako Basin

2 PROBLEMS

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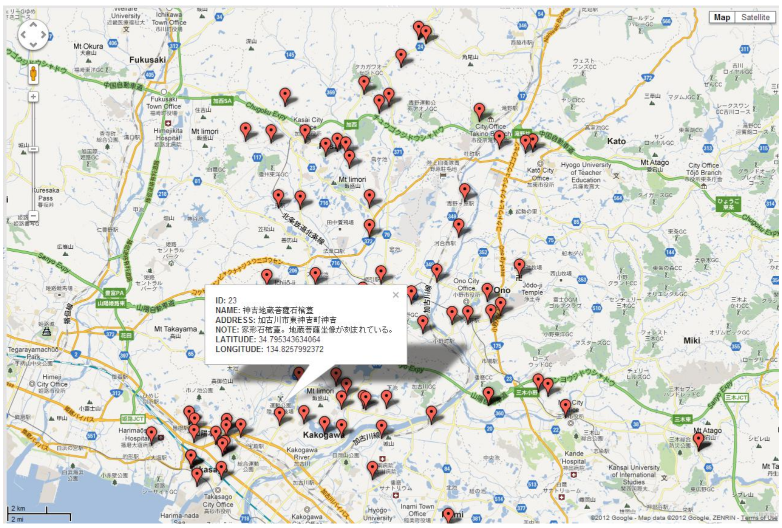

Fig. 2　Cultural Heritage Map in the Kako Basin on GIS

First, we confirmed the geographic coordinate values according to the positional information on the "Cultural Heritage Map in the Kako Basin" using Digital Japan Portal Web System. Next, the confirmed coordinate values were combined with the attribute data. Lastly, we uploaded the resulting data to Google Fusion Tables and created an image on Google Maps. This web map contains the attribute data for each stone coffin and users can easily view this data simply by clicking each point.

However, the high resolution, large scale background map could possibly lead to security problems for guarding the cultural heritage sites (fig.3) .As Google Maps often shows exact locations of the sites, it is quite easy to pinpoint the exact spot of a coffin using our digital map with a margin of error of less than a meter. Normally, stone coffins are too large and heavy to be moved by humans; however some are comparatively less heavy in weight and it is not impossible for looters to move them. In addition, these stone coffins are often reused as Buddhist statues and worshipped by local residents. Archaeologists and cultural resource management officers need to have the most accurate location data for research and management reasons. On the other hand, they must protect these coffins from looters. Therefore, when we intend to open our heritage data to the public, we should make sure the data does not endanger the security of the cultural heritage sites at the same time.

Fg. 3 High Resolution, large scale background map

3 METHODS AND EXAMPLES

There are four methods to solve this problem. First, show the locations with relatively large markers (Fig.4). This way, we can provide the approximate location of a specific cultural heritage with a circular or polygonal marker without revealing the true geographic points. Second, only provide the approximate address names without using markers (Fig.5). Unlike Western countries, almost all the addressing system in Japan is not street-based but area-based. Using an address name of a large scale administrative area, there is no need to reveal the exact spot. Third, round off the coordinate values. For instance, instead of showing the exact value, e.g. 134.8257992372, provide the rounded down value of 134.8257000000. However, this might be misleading, because the users might think the rounded down value is the exact spot. Finally, set the range of the scales users can access so that they cannot reach the precise information (Fig.4).

Fig. 4 Use a polugonal marker or fix the max zoom level

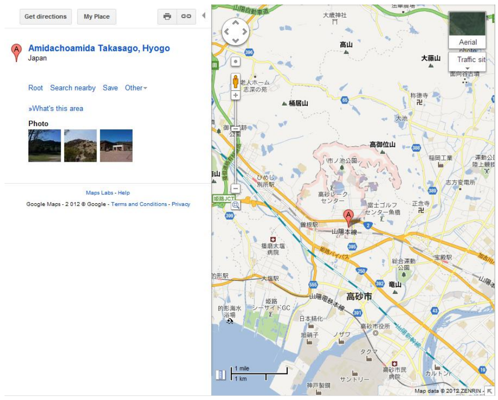

Fig. 5 Indicate only address name

4 CONCLUSION AND FUTURE TASKS

Which of the above is the best solution is likely to vary depending on the case. In many cases, we may have to combine two or more methods mentioned above. The goal of this paper is to discuss the reasonability of modifying the location data of a local heritage site from the point of view of protection, as well as its merits and demerits. Recently, there have been some cases where the letter “S” in the “GIS,” abbreviation for “Geographical Information System,” stands not only for “System” but also for “Science,” “Society” or “Security.” This is related to the accelerated movements in which the geospatial information is seen more comprehensively and placed in the context of science and the application range of the geospatial information is discussed in the context of society. Archaeologists and cultural resource management officers, who have been planning to transmit the information on the cultural properties by using the location data, should regard this as an important issue. What must be avoided is putting the security of the cultural heritage sites in danger due to neglect of considering the importance of “G-I-Security”.

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