

# ***Universal Access to 145 Countries' 878 World Heritage Sites with Cutting-edge Technologies***

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<http://whc.unesco.org/en/news/326>

## **Abstract**

In this paper, the author will share her cutting-edge technology application in presenting the 878 World Heritage Sites of 145 countries inscribed by the UNESCO World Heritage Center (WHC) to the world. With the simple click of the mouse, one is able to access multimedia and multilingual information on any one of the chosen site from a chosen country or region, or one is able to choose desirable image(s) from all available photographic resources of the whole world. Traditional method in retrieving desired information via fields like title, location, keyword, etc. are not most used since users generally do not know these information in the beginning, thus numerous featured retrieval methods including geographical, country, tempo, as well as content-based image retrieval (CBIR) are introduced for easy access.

## **1. Introduction**

In November 2006, the World Heritage Center (WHC) signed a multi-year Memorandum of Understanding (MoU) with Simmons College, Boston, Massachusetts, USA, to establish the first World Heritage Digital Center (WHDC) under the leadership of Dr. Ching-chih Chen. "The World Heritage Center considers this an important project with great potential to enhance the humanities for universal access and enrichment through the use of emerging technologies," commented Francesco Bandarin, Director of the WHC.

This MoU has led to the development of *World Heritage Memory Net (WHMNet)* since 2007. With intensive R&D effort extending capabilities far beyond those of the *Global Memory Net (GMNet)* (<http://www.memorynet.org>), *WHMNet* has begun to emerge as a launchable site for universal access, which will greatly promote a better knowledge of World Heritage properties and increase awareness of everyone's duty to protect them.

This paper will provide a preliminary bird's eye view of what promises to be an invaluable web-based knowledge base of World Heritage.

## 2. How Does WHMNet Work?

With limited amount of time and space, it is difficult to do justice to attempt to provide an overview of such a huge project. Thus, only the bird's eye view can be provided in the following with the help of abundant graphics. "A picture is worth a thousand words," thus the graphics will help us to decrease substantially the detailed descriptions.

WHMNet has not been launched for public access yet. At the present, only 286 of the 878 sites have been processed and uploaded to our Server. Thus, all presentations here are still preliminary without the final interface and graphic design.

Figure 1 shows preliminary Home Page of WHMNet.



Figure 1. Preliminary Home Page of WHMNet

One can see from the left panel in blue (see Figure 2) that all 878 sites will be able to be accessed collectively or by Region/Continent. All necessary textual information can further be obtained from the additional resources as listed in the right upper panel as shown in Figure 3. In the bottom of Figure 3 is the Tag Cloud which is linked to the terms most frequently linked in the searches which have been conducted. Since, the site is not available for universal access yet, the words showing are more related to our internal searches, and therefore in preparation for this paper, it is understandable that "Vietnam" is showing as one of the most frequently searched terms. From Figure 2, one can further move from a chosen Region/Continent to Countries and Sites as shown in Figure 4.



Figure 2. Left Panel



Figure 3. Right Panel  
Upper: Global Info Resources  
Lower: Tag Cloud

When one looks at the Left Panel (Figure 2), one can choose the WORLD or any of the Regions/Continents listed. For example, when the WORLD is chosen, then all available sites are listed by Country alphabetically on the left center column as shown in Figure 4, and all the sites are arranged alphabetically on the right center column of Figure 4.

As of March 20, 2009, only 286 of the 878 sites have been processed and uploaded to the server, thus, Figure 4 shows “The World’s 286 sites.” Based on UNESCO/WHC’s classification, the 878 sites are classified in:

- Cultural
- Natural
- Mixed (both cultural and natural)
- Heritage In Danger

Figure 4 shows that the world heritage sites are appropriately indicated with symbols of the types of sites on the Map as shown on the right column of Figure 4. Thus, one can move horizontally to view all the sites in the world, or select any one of them.



Figure 4. All available World Heritage Sites are shown by country, name of site and geographical map.

## *A Quick Glimpse of the World Heritage Sites*

If we have no idea what we can expect to find information on the 878 sites in the world, the two buttons – “Image Gallery” and “Random Images” can be of great help. “Image Gallery” will bring out the 12,957 images of the 286 sites currently available on the server in the order of “accession,” or the order the images were added. Eventually the total number of images for all 878 sites will be more than 40,000 images, thus browsing these many images from one page to the other can be a very tedious and time-consuming process. Thus, this may not be as useful for the current intent.

But, the “Random Images” feature will serve the purpose well! It will randomly provide images of the 12,957 sites, so that one’s knowledge on the World Heritage Sites will increase dramatically from a few simple clicks of the button because each image will also be shown with the title of the Site. Once an image of interest is spotted, one can find images of similar color and shape in all World Heritage Sites, as shown in Figure 5. Thus, for example, a similar Roman Column can be found in Italy, various parts of Europe, Africa etc. One’s knowledge again will be expanded quickly on a chosen image.

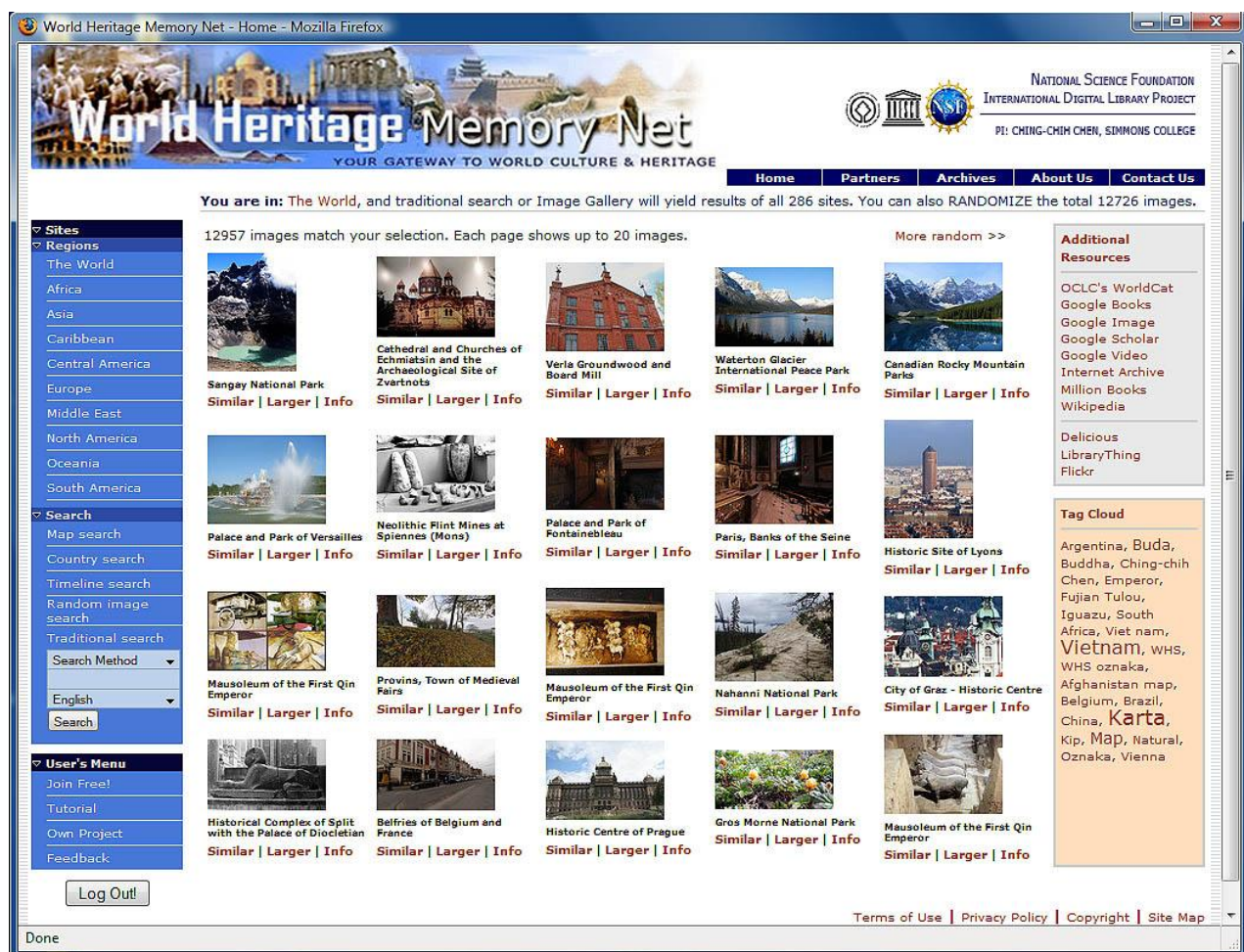


Figure 5. Random images of the current 12957 image collection are shown with titles of the Sites, and one is given the choice of finding similar images, enlarging the image icons, or getting the site information

## When Asia and Vietnam Is Chosen

Since we are in Vietnam, let's select **Asia -> Vietnam**. Instantly, 5 World Heritage Sites in Vietnam are displayed with the map locations and types of sites indicated, as show in Figure 6.



Figure 6. All 5 available World Heritage Sites in Vietnam are shown.

## When “Complex of Huế Monuments” Is Chosen

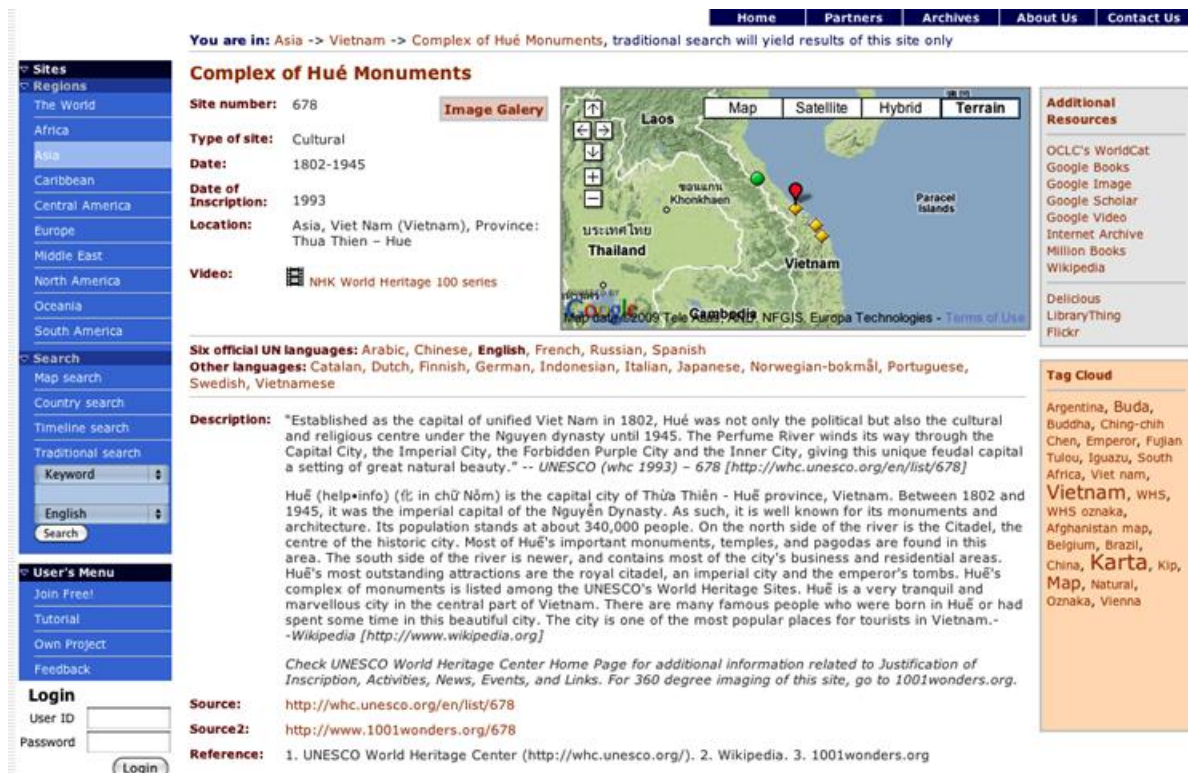


Figure 7. Instant showing of descriptive information on the Site in multiple languages as well as Site links to videos and 3-dimensional tour, as well as Image Gallery

As shown in Figure 7, when one click on the Site name of the “Complex of Huế Monuments,” instantly one is offered the official descriptive information as well as other available information in multiple languages.

### Instant Multilingual Access

For all Sites, the six UN official languages – Arabic, Chinese, English, French, Russian, and Spanish – are available, as to other languages, the number differs from a few to the maximum of about 80 languages. One can obtain the multilingual information instantly by clicking on the language indicated as shown in Figures 7 and 8.

**顺化历史建筑群**

**Site number:** 678

**Type of site:** 文化遗产

**Date:** 1802-1945

**Date of Inscription:** 1993

**Location:** 亚洲, 越南, 顺化

**Video:** NHK World Heritage 100 series

**Image Gallery**

**Six official UN languages:** Arabic, Chinese, English, French, Russian, Spanish

**Other languages:** Catalan, Dutch, Finnish, German, Indonesian, Italian, Japanese, Norwegian-bokmål, Portuguese, Swedish, Vietnamese

**Description:** 顺化历史建筑群位于越南平治天省。是越南历史古都。1993年入选《世界遗产名录》。顺化历史建筑群坐落于香江两岸，西靠长山脉，东距南海约8公里。1635年—1945年间，顺化作为旧阮、西山阮、新阮等越南地方封建王朝的都城，遗存了大量这一时期的历史建筑。其中顺化故宫最为著名，是仿效北京紫禁城修建的。郊区的保存着皇帝陵墓，古迹群还包括天姥寺、耀帝寺、慈源寺、灵光寺等。--《世界文化与自然遗产博览会，中国沈阳，2007年六至十月》

顺化（喃字：化、Huế），是越南中部承天顺化省的省会，面积150平方公里，人口约34万。古称富春。曾先后为西山朝和阮朝（1802年-1945年）的京城，是越南的古都，以历史古迹著称。1993年，顺化历史建筑群被联合国教科文组织列为世界文化遗产。位于越南中部，北距河内540公里，南距胡志明市644公里，西靠长山脉，东距南中国海8公里。香江穿城而过，将城市分为北南两区。北区是老城，又有外城和内城之分。外城城墙高6米，有护城河环绕。-- Wikipedia [http://www.wikipedia.org]

检查联合国教科文组织世界遗产中心首页相关的其他信息，以说明理由的题词，活动，新闻，事件和链接。去 1001wonders.org，寻求这个网站的360度成像。

**Source:** <http://whc.unesco.org/en/list/678>

**Source2:** <http://www.1001wonders.org/678>

**Reference:** 1. UNESCO World Heritage Center (<http://whc.unesco.org/>). 2. Wikipedia. 3. 1001wonders.org

**Six official UN languages:** Arabic, Chinese, English, French, Russian, Spanish

**Other languages:** Catalan, Dutch, Finnish, German, Indonesian, Italian, Japanese, Norwegian-bokmål, Portuguese, Swedish, Vietnamese

**Description:** أُنشئت باعتبارها عاصمة موحدة لفييتنام في عام 1802، قلم تكن Hué مركزاً سياسياً فقط ولكن أيضاً ثقافياً ودينيّاً تحت حكم النغوين حتى عام 1945. وإن نهر البيرغويوم يخترق العاصمة، والمدنية المحرمة الارجوانية والمدنية الداخلية، مما يعطي هذه العاصمة الإقطاعية الفريدة موقع ذو جمال طبيعي كبير. --UNESCO (whc 1993) - 678 [http://whc.unesco.org/en/list/678]

زوروا الصفحة الرئيسية لموقع مركز التراث العالمي التابع لليونسكو للحصول على معلومات إضافية تتعلق بميراث التسجيل، والأنشطة، الأخبار، الأحداث، وروابط أخرى. و لصور 360 درجة من هذا الموقع، انتقل إلى 1001wonders.org

**Source:** <http://whc.unesco.org/en/list/678>

**Source2:** <http://www.1001wonders.org/678>

**Six official UN languages:** Arabic, Chinese, English, French, Russian, Spanish

**Other languages:** Catalan, Dutch, Finnish, German, Indonesian, Italian, Japanese, Norwegian-bokmål, Portuguese, Swedish, Vietnamese

**Description:** Huế là một thành phố ở miền Trung Việt Nam và là tỉnh lỵ của tỉnh Thừa Thiên-Huế. Là kinh đô một thời của Việt Nam, Huế nổi tiếng với những đền chùa, thành quách, lăng tẩm, kiến trúc gắn liền với cảnh quan thiên nhiên. Năm 1306, Công chúa Huyền Trân về làm vợ vua Chiêm là Chế Mân, đổi lấy hai châu Ô và Rí làm sinh lễ. Năm 1307, vua Trần Anh Tông tiếp thu vùng đất mới và đổi tên là châu Thuận và châu Hóa. Việc gom hai châu này làm một dưới cái tên phủ Thuận Hóa (chữ Hán: 順化) được thực hiện dưới thời nội thuộc Nhà Minh. Đến đời Nhà Hậu Lê, Thuận Hóa là một đơn vị hành chính cấp tỉnh. Năm 1604, Nguyễn Hoàng đã cắt huyện Điện Bàn thuộc trấn Thuận Hóa, nâng lên thành phủ, sáp nhập vào trấn Quảng Nam. Thuận Hóa dưới thời các chúa Nguyễn, (thế kỷ 17- 18) là vùng đất trải dài từ phía nam đèo Ngang cho tới đèo Hải Vân.--Wikipedia [http://www.wikipedia.org]

Figure 8. Switching metadata from Chinese to Arabic to Vietnamese languages

## Instant Multimedia Access

Figures 7 and 8 also show that in addition to the multilingual descriptive information on the “Complex of Huế Monuments” Site, various associated multimedia information can also be instantly retrieved and displayed. By clicking on:

- <http://www.1001wonders.org/678> (as indicated on Source2), one can take a 3-dimensional tour of the site.
- Video, NHK World Heritage 100 Series, one can view the video as shown in Figure 9.

Image Gallery, where an image collection on the Site can be viewed and zoomed with dynamic digital watermark as shown in Figure 10. In addition, “Similar” will enable one to retrieve images from all World Heritage Sites with similar colors and shapes.



Figure 9. Video on Huế Monuments

You are in: Asia -> Vietnam -> Complex of Huế Monuments, traditional search will yield results of this site only

### Complex of Huế Monuments

59 images match your selection. Each page shows up to 20 images.

1 | 2 | 3 | next >>

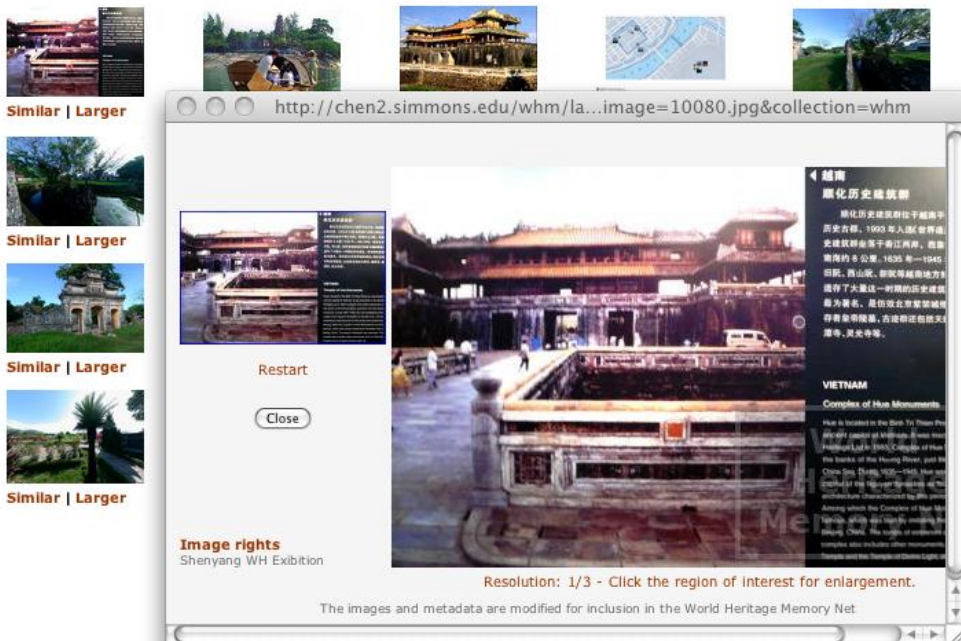


Figure 10. Image Gallery provides 59 images on the Site

## Geo- and Tempo Retrieval Capabilities

In addition to the whole array of features described above, more geo- and tempo retrieval capabilities are available. Figure 11 show how one can go to browse the world map and click on any site of interest for further information on the upper Map Search, or select the country of interest from the countries listed in the lower screen of the Country Search. The 878 Sites are

from 145 countries, but currently with only 286 Sites on the Server, only those countries in Brown are available.

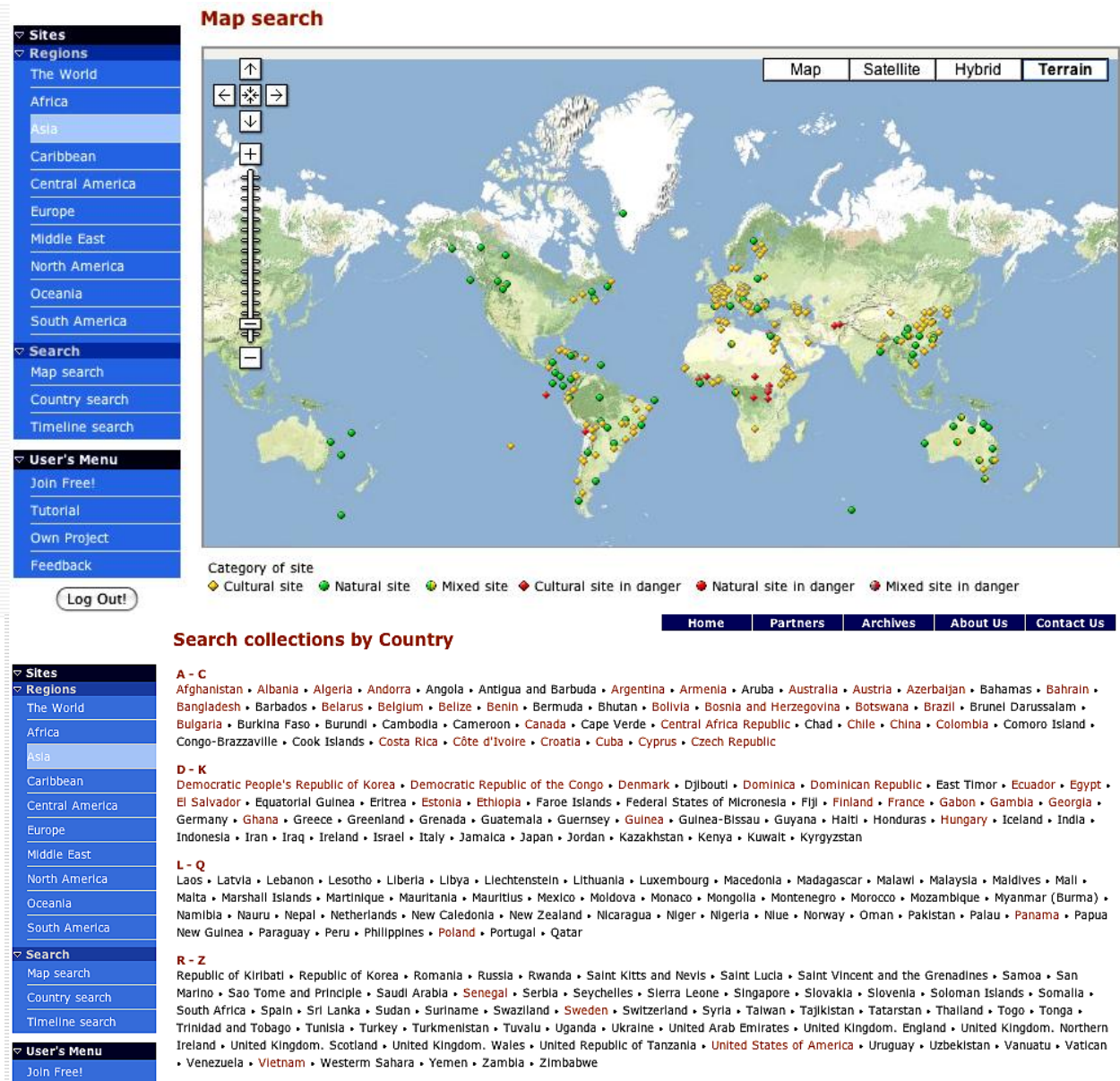


Figure 11. Upper: World Heritage Sites are geographically marked with appropriate “type” symbols  
Lower: Countries are alphabetically arranged with those in “brown” are currently accessible

In addition to geographical access to the World Heritage Sites, tempo access is also available. This is an important feature because the 878 sites ranges from those prehistoric ones with age of millions of years, to Sites of the 20<sup>th</sup> or even 21<sup>st</sup> century, such as Sydney Opera House in Australia. On *WHMNet*, one is able to horizontally browse through time, and select the sites of interest, and then obtain quick descriptive information instantly. Figure 12 shows that the “Complex of Hué Monuments” Site starts around Year 1800. Note that the UNESCO WHC’s basic descriptive information is provided. In general, we have placed emphasis on those sites no older than 300BC. Also, “natural” sites are not included for obvious reasons.

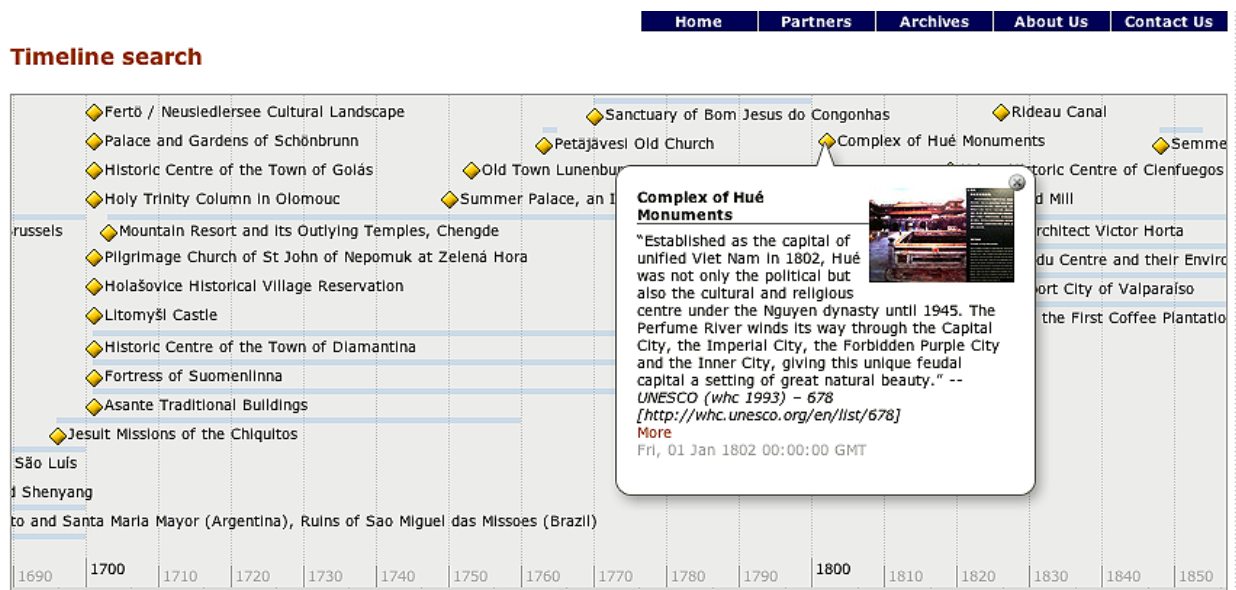


Figure 12. Timeline retrieval of the “Complex of Huế Monuments” Site

### 3. Conclusion

The bird's eye view of *WHMNet* presented in this paper covers only the tip of the iceberg of the functionalities of this important global digital project. It is clear that with the help of cutting-edge technologies, for the first time, multimedia and multilingual information on the world's invaluable heritage sites are able to be accessed and obtained instantly with a simple click of the mouse.

The MoU signed by UNESCO World Heritage Center with Simmons College is recognition of the interest of UNESCO in activities or research of *WHMNet* because this project has the great potential to provide universal access to the World Heritage Sites in a way not possible before. The *WHMNet* project leverages on the innovative technology developed and utilized in our *Global Memory Net*, which has already reached citizens and scholars from over 3412 cities of 125 countries in the last 18 month. We expect that *WHMNet* will reach a much greater global audience with its much enhanced multimedia and multilingual capabilities. It has great potential to enhance the humanities for universal access and enrichment through World Heritage Sites by using cutting-edge information technologies, and thus contributes in the promotion and awareness-raising of the UNESCO's 1972 Convention.

### 4. Acknowledgment

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