Interim Project Report
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The Pleiades Project team is pleased to report a range of developments that continue to affirm NEH's investment and that extend the project's value to scholars, students, and the general public worldwide.

During the reporting period, we enacted significant improvements in user experience on our website and welcomed the creation of 3,114 new Pleiades information resources (places, locations and names) as well as many thousands of updates. Some of these changes were carried out by individual contributors working through our website interface and editorial workflow. Others were facilitated through third-party and behind-the-scenes methods.

Enhancements to the Pleiades User Experience

Individual users of the Pleiades website can now benefit from **map enhancements** that better facilitate searches for and modifications to content. For our digital base maps, we have switched almost entirely from Google Maps to map tiles served from MapBox.com and Pelagios (for the latter, see below under "Pleiades and Pelagios"). This change gives us a cleaner, more responsive map interface and makes it possible for us to give our users control over whether modern or ancient features and labels are included along with the physical geography. We have also added a map and draggable location markers to the location editing form, where previously only text-based entry was possible. Search results, previously only presented as textual lists, are now accompanied by dynamic maps so that users can more easily find the content they seek.

We have added a **rating widget** that lets users express preferences for, or more confidence in, particular names and locations associated with a place. These preferences, when aggregated, let us favor new, highly accurate locations over older, less accurate ones when computing the representative points and extents of places that are used in our overview maps and data exports.

Pleiades users can now define their own **textual tags for content**. This feature is being exploited by the Pelagios map tile project to facilitate data sharing (see further below) and by Pleiades users developing content related to UNESCO World Heritage Sites.

We have also increased the **richness of records in our nightly, comprehensive data exports**. In response to requests from partner projects, we have enhanced both the tabular "data dumps" (in comma-separated value or CSV format) and the linked-data representations of our data (using the Resource Description Framework or RDF). Enhancements include the addition of feature types, user tags, and representative points and geographic extents for all objects.

In an attempt to simplify collaboration between Pleiades users and developers, we have switched to tracking non-content issues for Pleiades within the site itself. We previously used an external "bug tracker" for this purpose. This change means no separate login and no mental

switch to a different user interface, which should translate into better bug reports and better response from developers.

In June, we resolved dozens of cases of place duplication in Pleiades, moving duplicates to an errata folder and implementing links from those duplicates to the canonical places to ensure that inbound links from other websites are not broken, and that users arriving via those links find the most up-to-date information on our site.

Using Pleiades By Other Means

Many enhancements to Pleiades content and functionality were enacted behind the scenes, through scripted bulk updates, by services that operate separately from the web pages themselves, or through other programmatic interactions with partner projects. This development is the most remarkable of the reporting period: explosive growth in collaborative engagements with third parties who are drawing data from Pleiades for a variety of purposes and who are also contributing content, and even user-interface enrichments, back to the central Pleiades system. This far-reaching network consists largely of other digital projects in the past-oriented humanities, some headquartered at academic institutions, others constituted by individual enthusiasts or public interest groups. The network's rapid expansion can be contrasted with the more incremental growth we are seeing in individual contributions through our website. Seven people joined the ranks of active Pleiades contributors during the reporting period.

This dichotomy leads us to rethink the simple "crowd sourcing" vision that framed Pleiades at its start in 2006. Influenced by the then-groundbreaking model of Wikipedia and by the pioneering collaborative translation project called "Suda Online" (launched in 2000 by the late Ross Scaife and colleagues at the University of Kentucky), we imagined that most uses of, and enhancements to, Pleiades content would be enacted by individual, human users interacting with individual HTML pages on the Pleiades website. It is clear now that a significant portion of Pleiades' value comes, not just through the viewing web pages or filling out of forms on our site, but through interactions distributed across a network of third-party applications, projects, and communities of interest. Pleiades has emerged as the central authority and clearinghouse for the historical geographic information used and created by many individuals and projects, fostering collaboration and underpinning research and teaching in a variety of contexts.

Some salient examples of this valuable, distributed network in action (outlined below), illustrate both the achievements of the project during the reporting period and the widening potential for future success.

Pleiades and Pelagios: Linking Ancient World Information Resources

We introduced our collaboration with the external, separately-funded Pelagios Project in the previous report. Pelagios is a consortium of digital antiquities projects, led by Leif Isaksen at the University of Southampton and Elton Barker at Oxford University. Pelagios uses Pleiades place identifiers and Linked Open Data methods to provide cross-project search and relevance suggestion services for texts, images, museum records, and other materials on the basis of

similar geography. At the time of this writing, over 560,000 associations between such external web resources and individual Pleiades place resources were indexed by Pelagios. These are summarized, project-by-project, at http://pelagios.dme.ait.ac.at/api/datasets, where human users can browse or search the Pelagios dataset directly to find all partners' materials related to a given ancient place. Creators of web applications can exploit the Pelagios Application Programming Interface (API) to alert their own users to the availability of external information that is geographically related to whatever content they are viewing on their own site. The Pleiades website now does this for our users: the "Related Content from Pelagios" section of every Pleiades place page provides links, generated in real time, to related content elsewhere on the web.

The Pelagios Project represents a huge expansion in the utility and reuse of Pleiades content, as well as its availability to and value for a widening global audience. During the current reporting period, Pelagios added a significant number of participating institutions (with more in preparation). Many of these new partnerships grew out of conversations that started at the NEH-funded Linked Ancient World Data Institute (LAWDI), held at ISAW/NYU in early summer 2012. New Pelagios partners during this reporting period include: The British Museum, The Inscriptions of Israel/Palestine Project (Brown University), The Open Richly Annotated Cuneiform Corpus (ORRAC; University of Pennsylvania), ancientportsantiques.com, the University of Vienna's MEKETRE project (which is cataloging reliefs and paintings from tombs of Middle Kingdom Egypt), the Online Coins of the Roman Empire (OCRE; ISAW and the American Numismatics Society), Squichpix.com (which publishes photographs of historical cultural artifacts in Europe), The UK Portable Antiquities Scheme, and the Book of the Dead Project (Universities of Bonn and Cologne).

Pleiades content was also used as a source for another initiative of the Pelagios consortium: the open-access *Pelagios Digital Map of the Roman Empire*. Created by Johan Åhlfeldt, who has long been Pleiades' most prolific contributor, this digital map debuted in September and is already being used (for free) by a growing number of websites (including Pleiades itself) to provide a historical base map for the ancient Mediterranean world. The map also incorporates historical coastline and drainage data, as well as Roman road routes, developed by the Ancient World Mapping Center at the University of North Carolina at Chapel Hill. Last month, we brought 19,063 updates into Pleiades as a result of additional research carried out by Åhlfeldt as he prepared to produce the Pelagios digital map. These updates included over 2,200 new locations (i.e., more accurate coordinates).

Pleiades and the Ancient World Mapping Center: Custom Mapping and Better Data

The Ancient World Mapping Center was the birthplace of Pleiades and is a continuing partner in its operation. Their Antiquity À-la-carte mapping application, developed by Ryan Horne, was launched in September. It draws on Pleiades data to enable its users to create customized maps for online reuse and download in a variety of formats. It is designed to help scholars, teachers, and students produce better maps for the classroom, for conference presentations, and for publication, and to do so easily and at no cost on the basis of the best available data

(i.e., the Pleiades dataset). Users of the tool can select places of interest, customize labels, and control other aspects of map composition. If they discover deficiencies or opportunities to enhance the underlying data, they can click through to the corresponding Pleiades place pages to make their suggestions.

Antiquity À-la-carte pulls its content from AWMC's internal geographic database, which is updated nightly from Pleiades. AWMC also uses this data to support its research and commissioned mapping projects. We are currently working with AWMC staff to complete the collaborative circle: soon, when an AWMC staff member adds or improves coordinates or name information for a given geographic feature recorded in their database, it will be automatically updated in the central Pleiades system for the benefit of all.

Pleiades and the Stanford Geospatial Network Model of the Roman World (ORBIS)

ORBIS, created by Walter Scheidel and Elijah Meeks, launched to significant public acclaim earlier this year. The project models transport and travel connections and costs between a selection of nodal points in the Roman World. It is based on a sophisticated geographic model derived in part from Pleiades data. The ORBIS development team drew "nearly all of the coordinates" for the 751 sites included in its transport model from the Pleiades dataset.[1] The ORBIS web application provides links back to Pleiades content in a manner similar to Antiquity À-la-carte, facilitating the same sorts of interactions. During this reporting period, ORBIS has become one of our top 10 referring websites, bringing users into Pleiades from elsewhere. ORBIS has also recently joined the Pelagios consortium.

Pleiades and Trismegistos.org: Richer Data for Egyptian Places

In May, we added links between 376 places in Pleiades and corresponding geographic records in the Trismegistos.org database at Leuven, Belgium, which is directed by Mark Depauw. We also added 115 modern names from Trismegistos to Pleiades. These are mainly findspots of papyrus documents cataloged by Trismegistos in collaboration with our sister project, papyri.info, but also include some places that were origins or destinations for the personal letters and official documents preserved on some of the papyri.

Pleiades and Regnum Francorum Online (RFO): Linking Antiquity and the Early Middle Ages

Also in May, the Regnum Francorum Online (RFO) project, also led by Johan Åhlfeldt, provided us with a collation between 521 Pleiades places, corresponding records in RFO, and corresponding articles in the online Princeton Encyclopedia of Classical Sites (posted Perseus.tufts.edu some years ago under the direction of Gregory Crane). We loaded the references to RFO and PECS, as well as additional modern names Åhlfeldt had included, into Pleiades, thereby enhancing the information we provide to others and creating a path from

1 " ORBIS documents this debt on their website on a page for which there is no visible URL. It can be found by visiting http://orbis.stanford.edu, then clicking on the "Building ORBIS" tab, then clicking on the "Geospatial Technology" tab.

Pleiades place resources to Merovingian and Carolingian period information about the same places maintained at RFO. A listing of updated places and names is found at http://pleiades.stoa.org/search?Cites=RFO.

Pleiades and the Linked Ancient World Data JavaScript Library

Also in May, ISAW released the Ancient World Linked Data JavaScript Library. This free and open-source software package, developed by Sebastian Heath and Nick Rabinowitz with separate funding, can be installed easily on an existing web page. Once deployed, it adds functionality and visual elements to that page based on links to stable web resources relevant to the study of the ancient world. Pleiades links are well-served by AWLD.js, and feature prominently in demonstrations of the software. When users place their cursor over a link to a Pleiades place page in an AWLD.js-enabled site, a pop-up containing a map and description of the site appears, built dynamically from Pleiades data. This library has been widely deployed by ancient-world websites, and third-party developers have adapted for plugin use on some popular blogging platforms.

Pleiades and ISAW Papers: Scholarly Publication in Geographic Context

At ISAW, we continue to exploit and reuse Pleiades content and services across the entire suite of our digital publications efforts. Links to Pleiades are also inserted for every geographic reference made in articles released by ISAW's open-access digital journal, *ISAW Papers*, which is also produced under separate funding and edited by Sebastian Heath. The AWLD.js package is used to provide readers of these articles with contextualizing pop-ups as described above. The corresponding geographic annotations are also published into the Pelagios network so that the articles are automatically discoverable from Pleiades and other websites that exploit Pelagios. Heath reflects on the emerging effects of this practice at http://pelagios-project.blogspot.com/2012/10/2-way-linked-data-it-just-you-know-works.html.

Wikipedia Authors are Increasingly Citing Pleiades

According to the website usage statistics we get from Google Analytics, we have seen a 100% (to 750) increase in visits from the online encyclopedia Wikipedia.org. This likely reflects the growing citation of Pleiades in Wikipedia articles. The following URL launches a Google Search that lists the pages in Wikipedia that link to Pleiades: http://tinyurl.com/d6933ed. This search reported 2,290 such links at the time of this writing.

Measuring the User Experience

We are increasingly dissatisfied with the user metrics that we can derive from Google Analytics, as we believe them to be less-and-less representative of the ways users are exploiting the resources Pleiades provides. Specifically, Google Analytics measures only browser traffic to our HTML pages. It does not measure traffic to our KML files (for use in Google Maps and Google Earth), to our JSON resources (for use in third-party applications like Flickr.com and the AWLD.js library), or to our RDF resources (for use in Semantic Web and Linked Data contexts

like Pelagios). Further, Google Analytics cannot measure uses of data that are carried out on third party sites or individual user desktops following en masse downloads.

During the six-month period covered by this report, Google Analytics reports that individual, browser-based visits to the HTML portions of the Pleiades site are down 5% and page views down 12% from the previous 6 months. Causes are unclear. It may be that our efforts at disambiguation of content (e.g., different places with the same names) and improving search results have made it easier for users to find what they are looking for and so they visit fewer pages. It may also be the case that initial, drive-by visits to the site are decreasing because our potential audience is more aware of the project and what it contains. It may also be the case that more of our target audience is making use of our data through third-party applications or by downloading our entire dataset and using it in desktop tools.

At present we lack funds to conduct user surveys or to deploy programmer-analyst time to mine our own server logs for data that might shed light on these developments. We expect to seek funding to explore such questions in future.