# White Paper Report

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Project Director: Connie Lester (clester@mail.ucf.edu)

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RICHES

MOSAIC INTERFACE

White Paper

The Central Florida Mosaic Interface* – Stage II

(*Now RICHES Mosaic Interface™)

Connie L. Lester, PI

University of Central Florida

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# *RICHES Mosaic Interface™[1]* - Stage II, *Natural Language Enhancement*: White Paper

## A. RICHES™ and RICHES Mosaic Interface™ Project Narrative

### Introduction

The availability of digital archives has transformed research capabilities. To date, however, most digital archives remain passive, providing images and documents in response to specific requests. The authors of a recent National Endowment for the Humanities-funded project titled "Supporting the Changing Research Practices of Historians" called for increased digitization of archival sources, the creation of new tools for interactive use of digital sources, and the development of capabilities for connecting smaller archives to larger repositories.[2] The Regional Initiative for Collecting the History, Experiences, and Stories (RICHES™) of Central Florida and its digital archive, RICHES Mosaic Interface (RICHES MI™) previously called Central Florida Mosaic Interface (CFMI) has addressed these issues to provide an innovative, interactive access to archival information while incorporating the best practices of libraries and archives. In addition to providing new search capabilities, RICHES MI™ uses an Omeka platform for hosting exhibits and research results. Users can both research their projects and present them to other users. An NEH Digital Start Up grant awarded in April 2011 funded the development of Natural Language search capability for RICHES MI™.

RICHES™ and RICHES MI™ are projects that originated in the Department of History at the University of Central Florida (UCF) and fulfill the mission to connect academics, students, policy planners, and the public through interdisciplinary projects addressing regional themes with global connections. The RICHES MI™ database represents the archival material drawn from forty academic, community and business partners to provide enhanced research capabilities for understanding Central Florida history. Researchers use key word and natural language searches to understand the connections between individual data returns from multiple archives and museums. RICHES MI™ launched a soft opening on September 27, 2012 and a public launch as RICHES MI™ 1.0 with Natural Language Search capability on February 16, 2013 during RICHES's third annual THAT Camp Florida. On July 4, 2013, RICHES MI™ 2.0

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[1] The title of this NEH-funded grant proposal was "The Central Florida Mosaic Interface – Stage II. The grant was awarded in April 2011. The title of the interface was changed after the grant was awarded for trademarking purposes.

[2] Jennifer Rutner and Roger C. Schonfeld, "Supporting the Changing Research Practices of Historians," *Final Report* (New York: ITHAKA S+R, December 10, 2012).

became available to users following the transfer of the database to Omeka 2.0, the opening of the "Add Your Story" feature, and the addition of map overlays to highlight specific data.

A core team of five members developed the site and is responsible for new program development: 1) Director of RICHES™ and Associate Professor of History, Dr. Connie Lester; 2) Senior Programmer Analyst Connie Harper; 3) UCF's Institute for Simulation and Training Computer Scientist, Dr. Paul Wiegand; 4) Adaptive Assessment Services Vice President, Dr. Larry Davis; 5) Metadata Editors Laura Cepero (2013-present) and Katie Marra (2010-2013).

# B. Accomplishments

## Overview of the RICHES Mosaic Interface site

The goal of RICHES Mosaic Interface™ is to provide users with a variety of search tools to explore a robust database that integrates items from small and large repositories as well as collections held by individuals. Through the use of map overlays and spoke diagrams, users can evaluate their results to explore other items in the database they may not have considered previously. As improvements are made to these tools, the RICHES™ core team expects that search results can be customized and mimic the results experienced through close consultation with a knowledgeable and experienced archivist. In addition to exploration of the database, users can add images, documents, oral histories, podcasts and videos to RICHES MI™ and can present their own research through the exhibit feature of Omeka.

A brief exploration of RICHES MI™ will demonstrate the various features, including the role of Natural Language Processing. The website's url is https://richesmi.cah.ucf.edu.

RICHES MI™ opens with a Google map view of Central Florida; a timeline with a sliding bar is in the upper left corner. Every item in the database is tagged with its Global Positioning System (GPS) coordinates and a date. The purpose for these tags is to allow viewers to see their returns in time and space. Users can adjust the timeline to meet individual search demands. They can also zoom in or out on the Google map to adjust the view from street level to regional, state, continental or global levels.

To initiate a search, users choose from a drop-down menu of categories that include Business and Economy, Government and Military, Social and Cultural, Flora and Fauna. Each category can be refined to limit the search. Users also can choose the type of item they wish to review: Document, Oral History, Podcast/Video, Still Image, Website, or Line Overlay. They can check "All Media" to include every type of item in the database. Work underway will add animations and visualizations to the menu choices. The number of items returned by the search will depend on the timeframe selected by the sliding bar of the Timeline feature.

Work supported by Digital Start Up grant provides users with a natural language search option. This search requires the researcher to type a word or words into the text box labeled Search Text and check the box labeled Natural Language. As with the category search, the User can adjust the timeline. See Appendix, Screen Shot 1 shows results using the category search. Screen Shot 2 shows results using natural language option.

Once the timeframe, language search or category and item type have been selected, pins will appear on the map and a list of items will be visible on the right side of the screen. Each pin contains a number that indicates the number of items associated with the search at that location. Clicking on a pin will cause the map to zoom into a closer view of the area and the original pin will become multiple pins, one at each site for a displayed item in the database.

Clicking on a listed item opens a pop-up screen with a thumbnail image of the item, GPS coordinates, and a brief description. A full-screen image can be viewed by clicking on the thumbnail. For some items (currently only railroads), clicking on the "pin image" in the pop-up screen will produce a map overlay of the historic route of the railroad line.
See Appendix, Screen Shot 3 shows the pop-up window. Screen Shot 4 shows a map overlay.

Within the pop-up window users have two options that will enhance their search.
- Clicking on the button "Open Item in Archive" takes the viewer to the Omeka 2.0 Archive and the full metadata for that item. Key words, reference materials and digital links to the contributing repositories are features users particularly find useful. For small museums and archives, the ability to link their website to RICHES MI™ improves their visibility and has the potential to bring researchers to their facility. For researchers, the links reduce search time by allowing them to find previously unknown materials housed in smaller, less accessible repositories. Student contributors appreciate the "publication" acknowledgement they receive as Curator of items they process.
- A second button labeled "Save to Bookbag" allows users to save any item to his/her individual Bookbag. To activate this feature, users must login and create a password. Users who store items in their Bookbag find them available when they return to the site and avoid time-consuming searches for useful items located during previous searches. This feature will be especially useful for students working in the database and for researches collecting materials for analysis.

The "Show Connections" button offers users a tool for analyzing their search results. Currently Show Connections is a prototype feature for helping users explore the relationships between different historical objects stored in the repository. It presents a graph (spoke diagram) in which each node represents an historical object and each edge between two nodes represents a suggestion that the connected objects are somehow similar. Users can navigate this graph by clicking on the neighboring nodes to explore items in the repository. See Appendix, Screen Shot 5 shows the Connections pop-up.

Profiles determine how items are connected in the connections graph. Currently RICHES MI™ uses three different measures of distance to determine similarity: spatial distance, how far apart the historical items are in time, and the differences in the tagging information for the items. This feature is still in early development. Anticipated changes include allowing users who are logged in to change the profile to accommodate their individual search criteria and save the resulting spoke diagram to their Bookbag. RICHES MI™ also seeks grant funding to deliver "unexpected" and "unique" connections, mimicking the knowledge-based advice of archivists, through the use of multi-objective optimization. See Appendix, Screen Shot 6 shows the current profile for all results.

Users can visit the Omeka Archive without using the map- and timeline-based tools by clicking the button Archives at the top of the page. Once in the Archive, users can browse the items and exhibits or search the Collection Tree. Exhibits have been created by students, RICHES™ staff and researchers using museum and private collections. The exhibit, "Origins of the Celery City, 1877-1913," was created by a graduate intern working at the UCF Public History Center in Sanford, Florida.

Finally, users can contribute items to the database using the "Add Your Story" feature. Adding to the database requires a login to access the step-by-step process. Contributors select an item type from a drop-down menu. Selecting an item type opens a window with a series of questions that assist in developing the metadata for adding the item to Omeka. The questions are straight forward and require no expect knowledge to answer. Once the questions are answered, the contributor uploads the item to the site. The contributor will receive an acknowledgement of the upload and a release form to sign and return. Upon verification of the material submitted and receipt of the release form, the item is added to the RICHES MI™ database. The Add Your Story feature simplifies the development of local history class projects. It gives local museums and archives greater control over the items they submit. It encourages individuals to interact with the history they see on the site and add information to build a stronger sense of community and history. For class projects, items can be combined to create exhibits—a potential that is being met currently in an undergraduate "Introduction to Public History Class" working on a survey of monuments in the Central Florida area.

RICHES Mosaic Interface™ uses open-source tools to develop a site that supports a robust database searchable by a variety of search options and presentations of results to provide users with multiple ways of analyzing the data. The site expands the research potential by connecting large and small repositories with private collections.

## Completion of Grant Goals:

- **Natural Language Processing**

Natural language processing, when applied to search and document retrieval can reveal implicit, topic-based, higher-order relationships between documents. To understand orders of relatedness, consider three hypothetical documents, A, B, and C. If documents A and B share several non-trivial words or properties, this indicates a possible semantic relationship. This is a first-order connection that can be discovered using a simple search. If documents A and C do not share any words, a simple search will indicate they are unrelated. However, if documents B and C share several words, there is an implied, or second-order, relationship between documents A and C.

Statistical natural language processing (SNLP) attempts to expose higher-order relationships by comparing the statistical properties of the text of documents. SNLP is applied within the RMI as part of the text-based search interface. A user enters a query and receives a list of related items that are present in the digital repository.

The list returned is generated using a variation of Latent Semantic Indexing (LSI)[3]. Each item in the repository has a metadata description. LSI estimates the "relatedness" between items by a statistical comparison of their descriptions. The comparison is done by counting the co-occurrence of words in all the descriptions and placing these counts in a matrix. The matrix size is dependent upon the number of words in the descriptions and the number of items in the repository. The mathematical calculation required breaks the large, co-occurrence matrix into smaller matrices that relate the descriptions and the using a common frame of reference. Once the frame of reference is established, any query using words found in at least two item descriptions will return repository items that are closely related to the query.

In May 2012, the team members requested a no cost extension of the project period due to timing issues involved the SNLP implementation. The user interface requires query feedback within seconds for a proper user experience. At the time, however, a list of related items in response to a query was returned in approximately 15 minutes. The extension for the grant project was used to reduce the query time to its present duration of approximately two seconds.

The timing issues were caused by increased complexity of the interface. The original project scope called for a single, simple search method to provide results for user queries. The simple search worked as intended, but did not provide deeper levels of connection between the results returned. As the project progressed and search using natural language processing was implemented, the timing difficulties surfaced. Titles, keywords, dates, descriptions, and locations from the metadata describing the repository items were now used for grouping and qualifying user queries. The number of repository items had

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[3] C.D.A. Manning and H. Schütze, *Foundations of Statistical Natural Language Processing* (Boston: MIT Press, 1999).

increased from the original 50 to 143 and, finally, 262 at the time we completed the initial SNLP query.

We initially suspected that our approach to SNLP queries did not account properly for the number of repository items. However, experiments with as few as 90 repository items produced similar timing results. We continued our investigation by exploring how the LSI algorithm was implemented, searching for a flaw in the algorithm logic.

Discussions with RICHES MI™ team member Paul Wiegand re-emphasized the fact that semantic relationships have multiple degrees of connectedness and can have vastly different representations within different data dimensions. We applied these observations to the SNLP query by limiting the computation to a multidimensional search within a single textual source (instead of several metadata fields). We also examined the tradeoff between the number of data dimensions and the quality of results obtained and adjusted the algorithm to consider a reduced set of 36 dimensions of commonality arising solely from the description metadata field of the repository items.

We also made changes to improve process efficiency. The more complex matrix operations (now reduced to 77 seconds from 8 minutes) were moved to an offline process. We also implemented a cosine measure to determine multidimensional closeness between repository items, the assumption being that semantically related documents would be "pointed" in a similar semantic direction.

Presently, the repository has over 1100 items that are publicly searchable with full, extended Dublin Core metadata entries. We are able to index the description data, precompute a 3532 x 576 term-document matrix, and reduce the search space to 36 dimensions in an offline process. Moreover, we are able to return query results in 1.53 seconds.

- **Content from established RICHES projects will be funneled into RICHES MI, the free, interactive database.**

  This ongoing goal of RICHES™ has been accomplished in several ways. 1) As of September 25, 2013, the database contained more than 1100 items, with several hundred items waiting to be processed. Mission 2000 by the June of 2014 will add another 1000 items to the database. The database includes images, documents, podcasts, video, and oral histories. The development of the database occurs through class projects in undergraduate and graduate history classes at UCF, through uploads of data by curators and archivists at smaller community institutions using the "Add Your Story" feature, through customized harvesting from other databases, and through the digitization of specify collections such as the Chase Papers at the University of Florida. More recently

RICHES has expanded its outreach to faculty and students at the University of South Florida at St. Petersburg, Daytona State College, and Bethune Cookman University to encourage faculty to add data from their class projects to the RICHES MI™ database using the "Add Your Story" feature.

- **Free and Open Source platform that can be a model for other locations.**

  RICHES MI™ uses Omeka 2.0, MySQL, Linux, PHP, Javascript, and Python for all development.  All code is free and open-source.  In addition, the project's senior programmer has developed several Omeka plugins that are available for use. Student work is uploaded with our customized CSV Import plugin for Omeka. Community input is added through the "Add Your Story" contribution process, also a customized plugin for Omeka.  We can harvest from other collections with our OAIPMH Harvester plugin, which allows selective harvesting and is available on GitHub.  We've customized the Harvest locally to import RICHES Veterans History Project data from the UCF library.  The RICHES™ GeoChron plugin allows the user to add more than one location/time to an item and is publicly available at GitHub.

- **Access to RICHES MI™ on internet and mobile applications will be free to all users.**

  RICHES MI™ can be used on mobile phones and tablets as a web application, but is not yet available as an app.

  RICHES MI™ is best viewed with Firefox, Chrome, and Safari on a computer with a resolution of 1024x768 or higher.

- **RICHES MI™ will provide publicity to a large body of sources.**

  RICHES™ currently has 40 academic, museum, archive, business, and community partners

  - **UCF Partners:** Departments of Film, Music and English, College of Education, School of Social Work, Burnett Honors College, Center for Humanities and Digital Research (CHDR),  Nicholson School of Communication, UCF Public History Center, John C. Hitt Library, Institute for Simulation and Training (IST), Center for Research and Education in Arts, Technology and Entertainment (CREATE), School of Visual Art and Design, Lou Frey Institute, and ADLab.

  - **Academic Partnerships:**  University of West Florida Next Exit History Project, University of Florida Special Collections, and Florida Atlantic University Department of Art, and Bethune-Cookman University.

- o **Business Partnerships:** Adaptive Assessment Services, i/oTrak, Simiosys, and the Florida High Tech Corridor Council.

- o **Archives, Museums, and Libraries:** Sanford Museum, History Museum of Seminole County, Florida Historical Society, Harry T. Moore Cultural Heritage Center, Mennello Museum of Art, Hannibal Square Cultural Heritage Center, Orange County Regional History Center, DeBary Hall, Geneva History Museum, GLBT Virtual History Museum of Orlando,, Navy League and Winter Gardens Heritage Center and Railroad Museum.

- o **Community organizations:** Orlando Philharmonic, Apopka Hope Center, Orlando Remembered, Creative Sanford, Inc., and Middle District Federal Court.

- **Include history from seven target cities in Central Florida.**

RICHES™ began its project with six target cities: Sanford, Titusville, Orlando, Maitland/Eatonville, Winter Garden, Daytona, and Deland. Although the archive contains material from each of the counties that include the six cities, not each city is represented. The project began with Sanford, the so-called Gateway to South Florida. Most of the material in the database is from Sanford and Seminole County. Collections from other areas include completed a small postcard collection of Orlando scenes; a documentary film on the Mims Cultural Heritage Center in Brevard County; an Omeka exhibit for the Hannibal Square Cultural Heritage Center in Winter Park; a history of the Florida High Tech Corridor Council; and a video history completed with CREATE and the Film and Music departments designed to celebrate the 20th anniversary of the Orlando Philharmonic Orchestra through oral histories; and the digitization of church records from Merritt Island.

We are in the process of adding more than 100 podcasts produced by graduate students in Dr. Robert Cassanello's podcasting class. One set of 50 podcasts were developed around the theme of telling the story of Central Florida in 50 objects. We are also working to provide access to two documentary films produced by undergraduates in an Honors College film class led by Dr. Robert Cassanello (History) and Dr. Lisa Mills (Film).

- **Use of RICHES MI in the classroom.**

As the examples above suggest, RICHES™ and RICHES MI™ have been successfully incorporated into the classroom in a number of courses. Every semester 2 or 3 classes contribute to the UCF Community Veterans History Project by collecting, transcribing and uploading oral histories with veterans in all branches of the service in both war and peacetime service. The spectrum of courses in which these histories are collected range

from military history to history of Iraq, History and Historians methodology classes, oral history, and a class in Ancient history that used veterans' oral histories as a comparison to military life in Rome. A class in social work obtained a grant from the Winter Park Health foundation to work with RICHES™ in conducting oral histories with elderly residents of assisted living facilities with the goal of improving patient-centered care. An undergraduate economics history class collected materials for adding to the database in agricultural history and the history of the Florida High Tech Corridor Council. At the graduate level, Public History classes participate in RICHES™ in a variety of ways. The "Intro to Public History" class of fall 2012 developed a plan for organizing the first community History Harvest for Spring 2013. A follow-up class, Community and Local History carried out the successful harvest at the UCF Public History Center. The Center, which is housed in a historic 1902 Seminole County public school building, focused the harvest on images and artifacts pertaining to the building and education in Sanford. Participants brought images, report cards and school newspapers for scanning. Short oral histories were conducted with contributors. The scanned items and oral histories were added to the RICHES M™I database. A second History Harvest with participants in the Creative Sanford, Inc., community theater project is scheduled for fall 2013. Participants in this Harvest have already provided oral histories that were used to develop the folk life play, *Celery Soup*, an annual production. They will be providing images and articles that illustrate their earlier oral history. Filming of the play will also add to the Omeka exhibit that the students will create as the final product.

## C. Audiences

RICHES MI™ project focuses on four audiences:
- Academic researchers: University faculty, archivists and museum professionals who use the site for research leading to publications and exhibits and who contribute materials through research and classroom projects
- Students: k-20 students who utilize the site for classroom projects. Working through learning modules, students gain knowledge of historical methods and learn to "think like a historian." Other classroom projects enable advanced students to gain hands-on digital archiving experience and provide opportunities for developing digital exhibits.
- Policy Planners: Public policy planners can use RICHES MI™ to gain historical context for policy reports and see the connections between seemingly unrelated data. The Visual Statistics feature and other visualizations will enhance the ability to view large amounts of data.
- Community: RICHES™ and RICHES MI™ provide opportunities for publicly engaged learning and shared authority through workshops on collecting oral histories, digitization for contributions to RICHES MI™ and History Harvests. Community members learn more about Central Florida history as they use the website to contribute their shared stories and images.

RICHES™ and RICHES MI™ includes a number of underserved audiences. Project partners include the Harry T. Moore Heritage Center in Brevard County and the Hannibal Square Heritage Center in Orange County which focus on African American history. The Apopka Hope Center works with migrant labor populations and the GLBT virtual museum captures the history of the GLBT community in Central Florida. The UCF Office of Diversity Initiatives recognized the work of RICHES among underserved populations with its 2011 Cultural Diversity Award.

## Publicizing the program to the RICHES Audiences

RICHES™ uses many outlets to publicize RICHES MI™. Early in the project RICHES™ worked with the marketing department of Adaptive Assessment Services, our partner in the grant, to develop a plan for publicizing RICHES™ and RICHES MI™. In January 2012, the Department of History hired a Coordinator of Community Outreach and Education to develop workshops, organize public events, develop brochures and newsletters, and provide information to media outlets for RICHES and Public History. Using these resources, RICHES™ and RICHES MI™ provided public access and presented the project at scholarly meetings.

- **Radio:** Project Director Connie Lester was interviewed about RICHES on two area public radio programs, *Art Beat* on WUCF, Orlando, and *Florida Frontiers*, the radio magazine of the Florida Historical Society, which is broadcast statewide on seven stations: WMFE Orlando, WUFW Pensacola, WJCT Jacksonville, WFIT Melbourne, WQCS Ft. Pierce, WUFT Gainesville, and WJUF Inverness. The programs are archived on the Florida Historical website at www.myfloridahistory.org.

- **Marketing Video:** The University of Central Florida Marketing Office created a video about RICHES and RICHES MI that first appeared on the university's public television station, and is now posted on the RICHES website.

- **Print:** RICHES™ and RICHES MI™ brochures, newsletters and book marks provide potential users with information about the project and access to the interactive site. RICHES also created a banner to use in exhibit booths and at conferences. RICHES was featured in a 2012 UCF Today article highlighted the Director's presentation at the Digital Humanities Alliance meeting.

- **Social Media:** Information about RICHES MI™ is available through Facebook and Twitter. Both Facebook and Twitter are updated regularly with information about changes in the site and with examples of additions to the database.

- **Workshops:** During the grant period, RICHES™ team conducted a number of workshops to teach skills for contributing to the database, including three oral history workshops, a Next Exit History workshop, an Omeka workshop, and a Contribution workshop.

- **THAT Camp Florida:** RICHES™ sponsors THAT Camp Florida as an annual event every February at the Center for Emerging Media, University of Central Florida.  The event attracts participants from the UCF campus, local digital firms, librarians and public school teachers, and participants from other universities, including University of Florida, University of West Florida, University of South Florida, New College and Rollins College.  At the 2013 THAT Camp, participants skyped in from Ohio State University and the University of Virginia.  The fourth THAT Camp is scheduled for February 15-16, 2014.

- **Public Presentations:**  During the grant period, the RICHES team introduced the project to local audiences at several events:  DeBary Hall (a local house museum in Volusia County), Sanford Historic Preservation Annual Meeting, Bethune-Cookman University History Department faculty, Institute for Simulation and Training faculty and staff, and the UCF Center for Humanities and Digital Research (CHDR) Open House in September 2012. RICHES staffers are regular speakers at area Rotary Clubs, Veterans organizations and historical societies.

- **RICHES Sponsored Events:**  RICHES™ sponsored and participated in a number of events at which project brochures and flyers were available and participants had an opportunity to explore the website.  There were three events at the UCF Public History Center: the beginning of the school year annual bell ringing attracted a large audience of community members and public officials; a neighborhood block party that brought "neighbors" of the center to the facility; and a History Harvest event drew participants who brought items to scan for the database.  RICHES also participated in the Seminole County Centennial Celebration in April 2013 with demonstrations of RICHES MI™.  Finally, RICHES MI™ provided participants at the UCF Annual Book Festival (2012 and 2013) with opportunities to explore RICHES MI™.

RICHES™ and RICHES MI™ also have been presented at regional, national and academic conferences and the director was invited to two digital humanities events.

- **Academic Presentations:** RICHES MI™ and individual RICHES™ projects have been presented at a number of regional, national and international conferences:
    o Organization of American Historians—invited workshop presentations on podcasting in 2012 (Milwaukee) and 2013 (San Francisco).
    o National Council for Public History—workshop on podcasting in 2012 (in conjunction with the OAH meeting).  The director was a panelist at the meeting in Ottawa, Canada in 2013 in a session exploring international podcasting.
    o American Historical Association—panel on RICHES MI and RICHES projects, 2012 (Chicago).

- o Gulf South Historical Association—RICHES presentation for a panel on digital media, 2012 (Pensacola).
- o Florida Society of Archivists—Presentation of RICHES MI, 2012 (Sarasota).
- o Florida Historical Society—Presentation of RICHES for a panel on digital history, 2011 (St Augustine).

- **Invited Presentations:** The director of RICHES™ was invited to present RICHES MI™ at the annual meeting of the National Humanities Alliance in Washington, D.C. in March 2012 and at the 23rd Annual Humanities Day at Bethune-Cookman University in Daytona, Florida in 2013.

## D. Evaluation

Evaluations and testing were performed at several stages of the project and proved to be a learning experience for the project.

- **Outside consultants:** Public History Program in the UCF Department of History engaged two scholars, Dr. David Staley, Ohio State University, and Dr. Douglas Seefeldt, University of Nebraska, to evaluate the Public History program, of which RICHES is a component in Spring 2012. The two consultants each spent two days on campus and met with the project director, the development team, and the RICHES™ technical staff. Both praised RICHES™ as an important component for the Public History Program. Both have remained in contact with the UCF faculty and have offered advice on several occasions. Staley encouraged RICHES™ to incorporate gaming into the RICHES MI™ agenda and Seefeldt provided advice on developing History Harvests to add to the database. Their reports were more generally about the Public History Program and have not been included in this report.

- **Testing:** The RICHES MI™ team did not engage in large-scale formal testing of the site. Internal testing and informal testing did occur periodically to assess the ease of navigation. In fall 2011, five volunteer members of the UCF History Department faculty and staff individually tested the site and again in June of 2012, ten members of the Florida Society of Archivists tested the site for navigability and conformity to good digital archive practices. In both cases, respondents provided reports that were positive but not helpful from a developmental perspective. Enthusiasm for the site inhibited analysis of potential difficulties.

  A more positive outcome developed when the RICHES MI™ team monitored the navigation of the site by Work Study students assigned to the project. These tech-savvy students came from various academic disciplines, ranging from Marketing to History to Medical Administration. As they worked through the site, team members monitored their progress and noted where they experienced difficulty in understanding next steps or

obtaining desired results.  Students were asked about the problems and worked with the team to redesign some aspects of the site to make it more intuitive and "cleaner."  One change was the inclusion of the FAQ Tutorials, which the students assisted in designing and populating.

Based on our experience with student workers, the RICHES MI™ team scheduled a workshop with our community partners to introduce the Add Your Story feature and to observe the use of that feature by a small group with a range of computer skill levels. Participants were asked to scan an item prior to attending the workshop, or to bring an item to be scanned.  Participants created a login to access the Contribution page, selected an item type from the drop-down menu, answered the questions associated with that item type, and uploaded the scanned item.  All fifteen participants successfully completed the tasks.  The most persistent problem for these participants was the need to download Firefox, Safari or Google Chrome browsers.  Most were users of Internet Explorer, on which RICHES MI™ runs very slowly.  To address that problem, RICHES MI™ now includes a popup to alert users to download another browser if they access the site using Internet Explorer.

As a result of their experiences, the RICHES MI™ team has adopted more directed testing formats that are likely to be connected with workshops.

- **Self-Assessment:**  Operating a project with so many "moving parts" on both the community side and the digital side is sometimes daunting.  At the same time, it is extremely rewarding.   The success of such a multi-faceted project requires both structure and freedom.  There must be processes in place to deal with the expectations of community and academic partners in order to prevent or minimize conflicts. RICHES™ has dealt with that by creating release forms for various types of contributions and Memos of Understanding with partners. The language of the MOUs outline the contributions and outcomes for both RICHES™ and the organization.  RICHES™ is forthcoming with its partners as to what can be accomplished within the limitation of resources.  We do not simply "fly in" and complete a project; we expect "sweat equity" from our partners. As a result some of our partners are now looking for their own funding to complete projects that will be entered into RICHES MI™.  As an example the Museum of Seminole County History is seeking funding to digitize 100 years of the *Sanford Herald* newspaper, which would be housed in the RICHES MI™.  We have partnered with the Sanford Museum and the UCF Hitt Library to re-process and digitize the Henry Sanford Papers (60,000 items) for RICHES MI™. Digitization of these papers would encourage research and would permit the mapping of the Sanford correspondence. These examples of two-way partnerships demonstrate the benefits both to RICHES™ and local repositories.

The success of the partnerships breeds its own problem.  As indicated earlier we now have 40 partnerships.  Although each is self-sustaining, success encourages new partnerships and increases the likelihood of overtaxing resources.  An immediate issue is how to manage our own success.  The RICHES™ team has entered into discussions with the College of Arts and Humanities administrators, the UCF Office of Research and Commercialization, and our business partners to seek advice on both funding and management issues.

On the digital side, RICHES™ benefits from the wealth of resources available in the Central Florida area.  At the center of the Florida High Tech Corridor, UCF hosts the Institute for Modeling, Simulation and Training, and Orlando is the home of numerous scientific and creative digital firms.  Our current team demonstrates the intersection of those resources; partnerships with three digital firms—Adaptive Assessment Services, i/oTrak, and Simiosys—and three academic resources—IST, CREATE, Center for Humanities and Digital Research and the School of Visual Arts and Design.  Working across academic disciplines requires respect for the contributions each makes to the project.  The RICHES MI™ core team benefits from the development advisory groups that also are interdisciplinary and which were present in the developmental phase of the project.  In other words, the project got "buy-in" from the outset.

- **Public Response:** As indicated above, the public response has been overwhelmingly positive.  Area archives and museums, some initially skeptical of the project, are now actively engaged in RICHES™.  The City of Sanford now includes information about RICHES™ on its website.  Go to [www.sanfordfl.gov](http://www.sanfordfl.gov) and click Community Links, Education.  RICHES conducts one to two workshops per semester.  These community events fill and there are often waiting lists.  Our Outreach Coordinator speaks to 2-4 organizations per month. Community organizations, historical societies and museums include their association with RICHES™ as evidence of outreach and collaboration in their own grant applications.

## E. Continuation of the Project

RICHES™ and RICHES MI™ was always conceived as an ongoing project that would continue to add new features to enhance the digital search process and add to the size of the database.  The success in creating an interdisciplinary and inter-university working relationship encourages a continuation of the project.  Students and faculty in several programs in the College of Arts and Humanities are developing their courses and research with a RICHES™ component.  At least one dissertation in the Text and Technology program has a RICHES™ component.  Faculty in History, Communication, Film, and Writing and Rhetoric are incorporating RICHES™ into their classes at the undergraduate and graduate levels through the creation of oral histories and podcasts,  the creation of digital exhibits for RICHES™, and the organization of History Harvests to

collect artifacts and images for incorporation into the RICHES™ database.  Faculty members have discussed the possibility of a digital project that explores the impact of business development along the I-4 Corridor.  Another has expressed interest in mapping her research on Black Seminole towns and migration of Black Seminoles between Florida and the Bahamas.  Interest at both the teaching and research levels supports the continuation of the project.

RICHES™ continues to seek grant funding for new features for the Mosaic Interface. A list of anticipated grant applications also indicates the future of the project.

- RICHES MI™ is seeking NSF funding to enhance the "Connections" feature through the implementation of Multi-Objective Optimization.  This project would be in collaboration with Dr. Paul Wiegand at the UCF Institute for Simulation and Training.

- RICHES MI™ is seeking NEH grant funding in collaboration with the Sanford Museum and the UCF Library to re-organize and digitize the Henry Sanford Papers and make them available through RICHES™.  Completion of the digitization of the papers would support big data projects and enable the mapping of Henry Sanford's correspondence that covers events in North America, Europe, Africa and South America.

- NEH Digital Implementation grant proposal in collaboration with the UCF College of Education to develop learning modules for the RICHES database.  These learning modules would require students to create narratives based on historical events.  Research for the projects would be conducted in the RICHES MI database and at local museums.  The data collected in the  RICHES MI™ and at the museum could be stored in each student's virtual Bookbag and accessed for developing the final narrative.  The projects would teach students to use the historical methodology and the "think like a historian."  A pilot project is underway at the UCF Public History Center.

- Other projects in early stages of development:
    - GIS map overlays of historic area maps to provide researchers with access to social, economic and environmental change over time.
    - Collection of statistical data to be used to development of visualizations to show change over time
    - Development of a street level visualization to provide a "walk down Sanford Avenue in 1920."  This street was designated by Henry Sanford in the original plat map as the African American business district for the City of Sanford.

o Development of an animation to show transportation changes in Central Florida from steamboats to railroads to interstates and airplanes.

### University of Central Florida Commitment

The University of Central Florida committed to the RICHES™ project in several important ways.  First, Academic Affairs provided the funding for the position of Director of RICHES.  Second, the Dean of the College of Arts and Humanities provided funding for a full-time position for the Senior Program Analyst and a part-time meta data editor.  The Dean also purchased a dedicated server for RICHES™ and the College of Arts and Humanities tech support team maintains the server.  Finally, the Department of History hired a full-time administrative assistant and a full-time Education and Community Outreach coordinator to provide staff support for RICHES™ and for the Public History Program.

RICHES™ and RICHES MI™ continue to work with the College of Arts and Humanities Foundation and with the UCF Office of Research and Commercialization to maintain the funding levels that are needed to add to the project.

## F. Long Term Impact

RICHES™ and RICHES MI™ have the potential to become models for studying regional history.  The organizational development of working academic, business and community partnerships and the incorporation by RICHES MI™ of multiple tools for searching, analyzing, and displaying results offer prospects for spin-off programs.  With this potential in mind RICHES™ trademarked the name RICHES™ and RICHES MI™ and the project logo.

RICHES™ has received several non-federal grants, including funding from the Winter Park Health Foundation, the Florida High Tech Corridor Council, and Learning Institute for Elders. As importantly, the project has received technical support and advice from its business partners, including Adaptive Assessment Services, i/oTrak, and Simiosys.

The University of Central Florida presents itself as a partnership university that provides "high-quality, broad-based education and experienced-based learning; pioneering scholarship and impactful research; enriched student development and leadership growth; and highly relevant continuing education and public service initiatives that address pressing local, state, national, and international issues in support of the global community."  RICHES™ and RICHES MI™ addresses those goals in its partnership development, its integration into undergraduate and graduate education, its innovative and interactive digital database, and its commitment to show that local is global.

Several additional long term benefits emerge from this project:

- The development of RICHES MI™ has produced a project that bridges the Humanities and STEM divide.  The complexity of demands the project makes requires the day-to-day active participation of historians, humanities, anthropologists, artists, musicians, designers, computer scientists, programmers, and engineers.  Each discipline contributes to an intellectual dialog that requires participants to re-think and re-create their own assumptions—the essence of academic endeavor.
- The partnerships between academia and the community are equal partnerships that promote the development of publicly-engaged learning.  RICHES™ asks its partners to work on the development of the project and share their understanding of local history, not simply add their name to a fully developed, top-down interpretation of their own story.  This has implications for invigorating public interest in history.
- RICHES™ and the UCF Public History Program are committed to the view that local history is global history.  The Central Florida area is a culturally diverse region in which local stories are linked to every continent and, with its connections to NASA, to the new regions of space. RICHES MI™ offers researchers opportunities for exploring and demonstrating those connections.

## G. Grant Products

In addition to the development of the RICHES MI™ site several technical and publication products were created or are in the process of development.

Work on RICHES MI™ produced several digital plugins that can be used with Omeka.
- Omeka makes it possible to harvest data from other Dublin Core repositories that expose their data through standard OAI Harvest interface.  This standard plugin only allows the user to harvest entire repositories.  A Harvest plugin developed by Connie Harper permits RICHES MI to harvest for individual items that will enhance the database.
- The GeoChron plugin enables RICHES MI™ to plot items with multiple locations on the Google Map.
- Modifications to the CSV import were incorporated into Omeka as standard features.

RICHES™ and RICHES MI™ documented its development in order to produce research materials for publication of scholarly articles.  The RICHES MI™ team has identified several areas for analysis including the Public History implications for a regional project, technical aspects of the RICHES MI™ database, and archival implications for RICHES MI™.

# Appendices
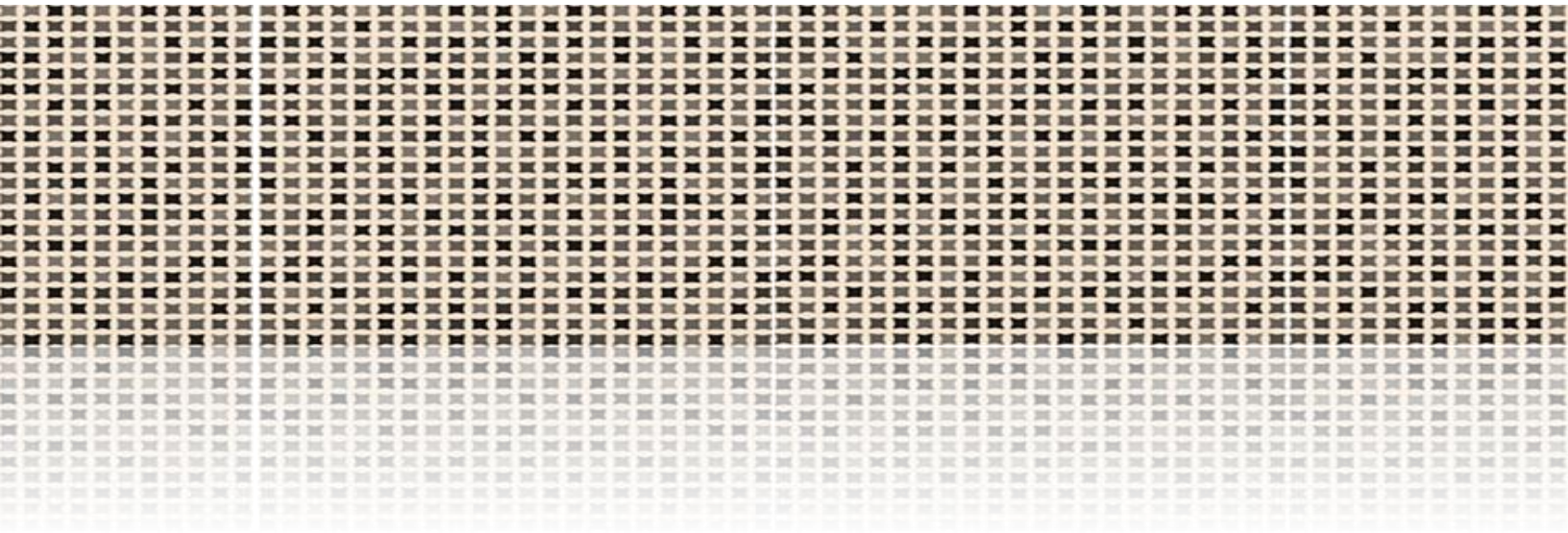
## Screen Shot 1- Categories and Pins with Search Results

## Screen Shot 2- Natural Language with Search Results
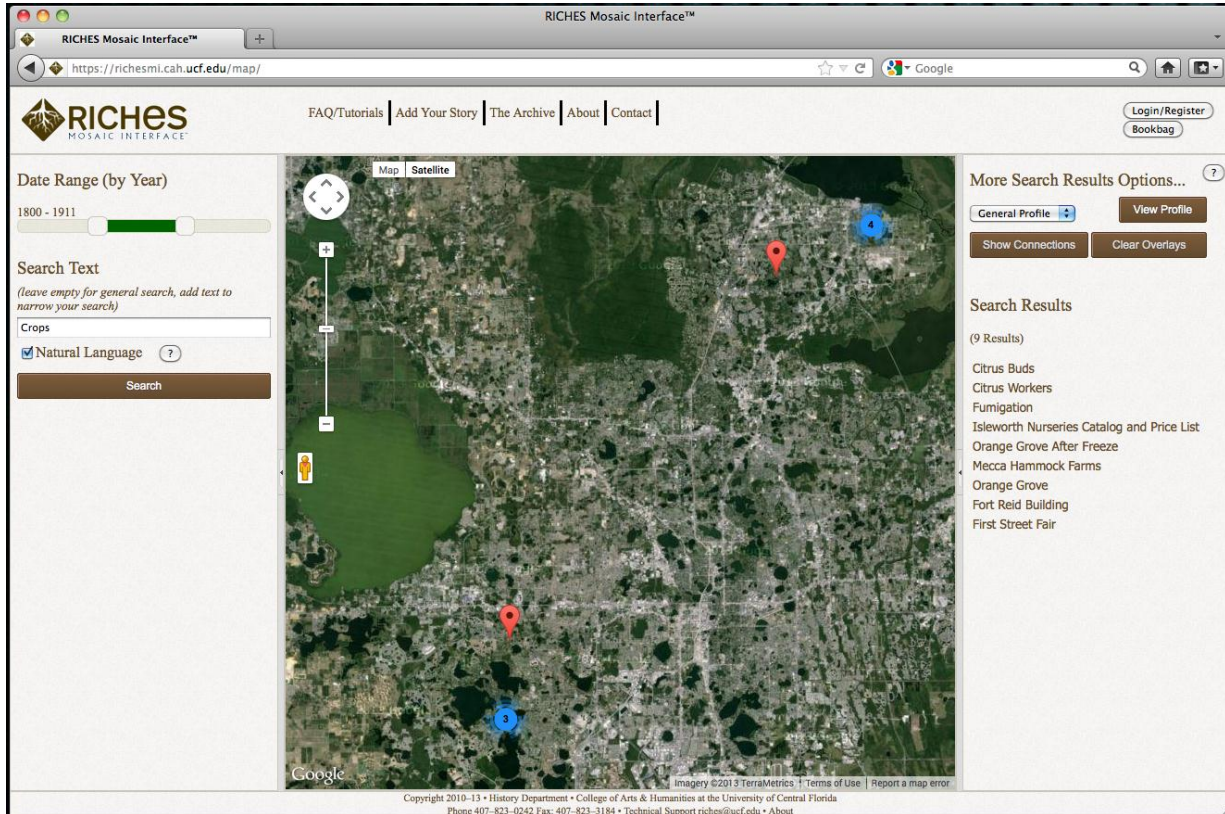
*Screen Shot 3- Pop-Up Window with Thumbnail Image/Description*



**Citrus Workers**                                                          ✖

**Three Citrus Workers**
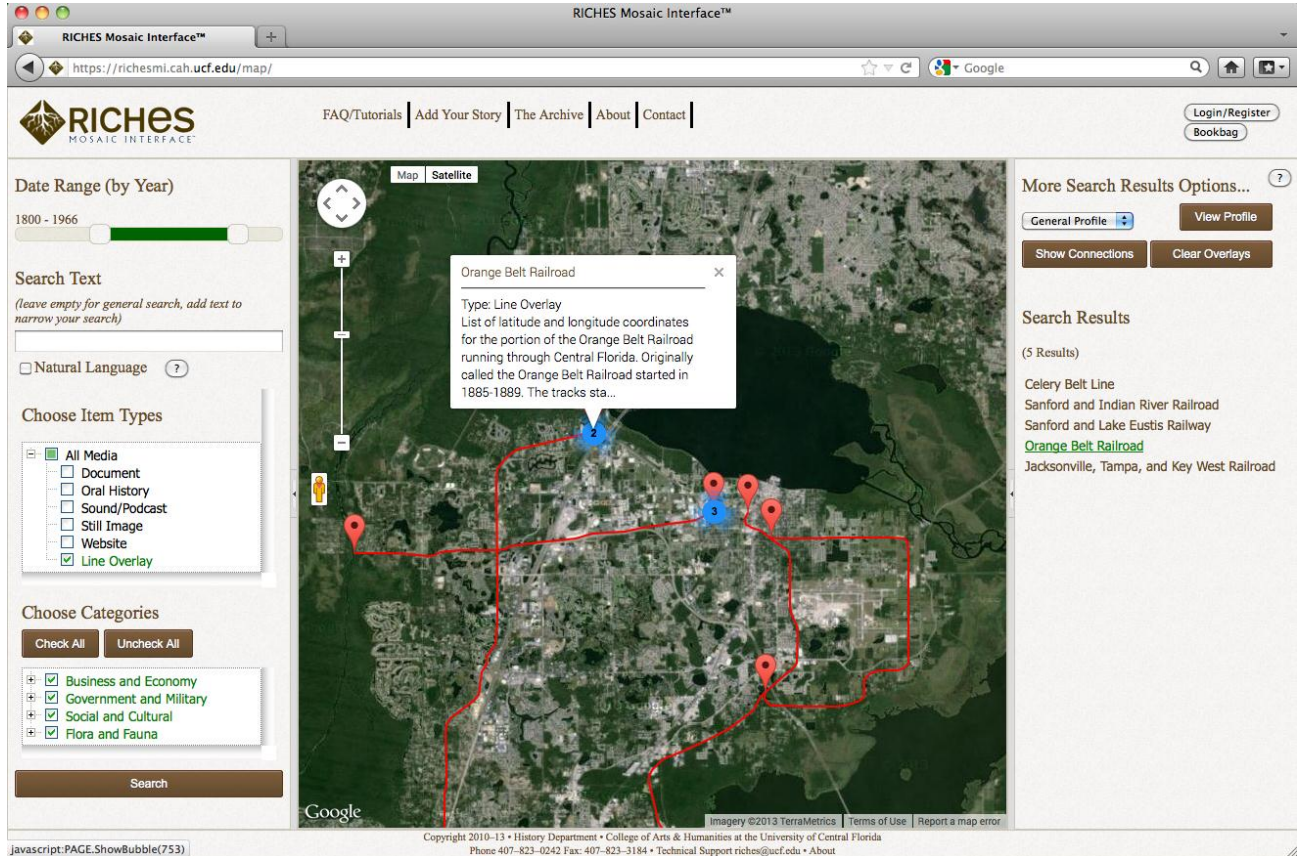
Time: 1904-01-01
Location: Windermere, Florida

In 1884, Sydney Chase, Sr., and Joshua Coffin Chase established Chase & Company in Sanford, Florida. Initially, the business offered fire insurance and sold fertilizer. By 1886, the Chase brothers purchased several citrus groves to expand their business. The company then constructed and operated packinghouses on their multiple properties and became a successful business in the citrus industry. Between 1894 and 1895, Central Florida was hit by several freezes and most of the citrus crop was destroyed. Chase & Company did not grow citrus crops again until 1904 when Joshua came back from an extended stay in California.

Type: Still Image
Size: 153 KB
Coordinates: (28.477571, -81.526537)

**Save To Bookbag**     **Open Item in Archive**

## *Screen Shot 4-Map Overlay*

## *Screen Shot 5- Pop Up with Connections*

*Screen Shot 6- Profile View*

**View Profile**                                                                    ✖

"Show Connections" is a prototype feature the RICHES Mosaic Interface™ is investigating for helping users explore the relationships between different historical objects stored in the repository. It presents a graph in which each node represents an historical object, and each edge between two nodes represents a suggestion that the connected objects are somehow similar. One can then navigate this graph by clicking on the neighboring nodes to explore items in the repository.

Profiles determine items are connected in the connections graph. Currently we use three different measures of distance to determine similarity: spatial distance, how far apart the historical items are in time, and the differences in the tagging information for the items. Different "connection profiles" provide different emphases on these three measures. This feature in its early phases, and we intend to continue to expand and refine it so that it becomes a helpful exploratory tool for researchers and general users of the RICHES MI.

Please give us your feedback at riches@ucf.edu

Profile Name: **General Profile**

Tag Measure:                          20

Space Measure:                        40

Time Measure:                         40

Minimum Connected Nodes: 3

Maximum Connected Nodes: 6

Levels:                               2

25