

If You Build It, Will They Come?
The Library of University of California Images in Transition

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Starting in the 1980s, a number of grassroots digital imaging initiatives began trying to address the issues related to the challenging transition from analog slides to digital images in post-secondary academic contexts. By “grassroots” it is meant small-scale digital imaging efforts developed to provide customized educational and informational services.¹ Two of the earliest such efforts that led the way and which are still expanding are Kathleen Cohen’s San Jose State University Digital Art project,² and Allan Kohl’s Art Images for College Teaching out of the Minneapolis College of Art and Design.³ These localized imaging projects began cooperative digital efforts between faculty and visual resources curators who have traditionally collaborated on developing 35mm slide collections for classroom teaching and study purposes. The points of intersection were that both players wanted to digitize image content relevant to teaching, they had existing and expanding 35mm slide collections and photographic rights to at least some of this material, and there was a desire to experiment with digital technology. This paper reports on the development and evolution of one such project—the Library of University of California Images⁴—exploring the didactic potential of the lessons learned to date.

Building It

Since these early efforts, other digital coalitions have emerged, aggregating and sharing digital images for educational and non-profit use.⁵ Many of these digital imaging projects emerged because digital technology provides the opportunity to reduce the redundancy that exists in the analog world and the opportunity to dramatically expand access to images across collections is an exciting prospect. In the case of the University of California, a recent survey indicated that the visual resources collections on the ten campuses presently archive over three million analog images and almost 200,000 digital images fundamental to research, teaching, and learning in architecture, the arts, and humanities.⁶ Of these images at least 500,000 circulate in a given academic year. Two of these visual resources collections are in UC libraries; seven other archives are located in departments or schools. The latter are not a part of the library system primarily because many faculty members prefer locally accessible image resources that reflect their particular areas of specialization, with staff that can spontaneously respond to their teaching needs.

The over three million images mentioned above do *not* include special collections in the UC libraries nor do they take into account biological, botanical, film, map, medical, musical or other collections scattered over the various UC campuses.⁷ The UC Libraries’ Systemwide Operations and Planning Advisory Group formed a Task Force on Digital Visual Resources Planning and is presently attempting to identify and review all of the visual material that the libraries own, determine the degree of digital readiness the image collections are in, and identify the pertinent issues that will need to be addressed for digital library development. This recent system-wide emphasis on visual resources suggests that digital technology has increased the demand for access to images on UC campuses, and probably not just amongst the faculty and students in architecture, the arts, and the humanities who have traditionally worked with images. Needless to say, digital imaging technology is an exciting prospect for this extensive state system with its potential to share dispersed collections, reduce redundancy, energize teaching, and stimulate learning.

Despite what appears to be an embarrassment of UC riches, in 1996 the reality for most of UC’s visual resources collections was isolation, limited funding, and the usual redundancy. It was then that the curators at the Riverside and Irvine campuses, Madelyn Millen and Maureen Burns, found themselves bemoaning the fact that their effort to convince the administration of the need for new hardware and software to support digital imaging projects had not resulted in any local funding. Most UC curators had textual databases used for slide cataloging and collection management purposes, but only a few visual resources collections were experimenting with digital projects. In fact, everyone was hard-pressed to keep up with 35mm slide requests and the faculty, generally, were not yet requesting digital images. For example, at the time, the collection

at UC Irvine was growing at the rate of 10,000 slides per year with 35,000 slides circulating annually. These statistics related to our analog work have not changed and the slide collection is up to almost 300,000 items, but now we also have forty thousand digital images to manage with faculty clamoring for more of both.

The work of a typical slide collection is driven by the faculty's research and curricular demands, therefore each of the UC collections reflect specific areas of faculty expertise with, of course, some curatorial discretion. For example, Irvine's art historian teaching the area of Japan is a Modernist, whereas other UC campuses focus more on the historical periods of the more distant past. Thus, each collection's Japanese art section develops differently, despite some inevitable redundancy, with the curatorial staff developing the Asian collections in other areas, such as India, to ensure the comprehensiveness of the overall archive. Every visual resources collection has faculty- and curatorial-driven idiosyncrasies that might be of particular interest when considering shared digital collections.

In addition, the UC campuses handle digital demands differently. Some have as few as 1,500 digital images and do only limited, local scanning upon demand, whereas others are adding digital materials systematically and have as many 60,000 digital images. Falling more into the UC category of "have-nots," the Irvine and Riverside curators started looking for funding opportunities with the *not* very profound goal of upgrading computer equipment, only to find a grant that compelled them to try and envision a more ambitious digital future for UC's visual resources collections.

They first looked at an exemplary model of digital imaging in UC's own back yard. Maryly Snow, on the Berkeley campus, started an ambitious digital project in 1985 to build a visual online public access catalog to the 35mm slide collection of the Architecture Visual Resources Library.⁸ It was named SPIRO in honor of the late architectural historian Professor Emeritus Spiro Kostof; the acronym stands for Slide and Photograph Image Retrieval Online. About 20 percent of the archive's total holdings are presently available in SPIRO. Typical of the mixed bag found in most visual resources collections, the images were acquired from a variety of sources: 40 percent came from images in books and 10 percent from periodicals both produced in-house; 30 percent were donor-supplied; and 20 percent were purchased from commercial slide vendors. The in-house production involves copy stand photography, which falls under the fair use and educational copying provisions of the U.S. Copyright Law. Licenses have been negotiated, obtained, and paid for the right to digitize the donor and vendor images.

SPIRO was one of the earliest of the grassroots projects providing Internet access to digital images or what Snow prefers to call a "fair use website."⁹ As the director of Berkeley's architecture collection and SPIRO's founder, Snow was a bit of a pioneer in terms of defining what a fair use website might be and based her research and subsequent policy on the library world's spirit of equal access to information. The copy photograph is digitized without expressed permission, but all the sources are carefully acknowledged. The size of the digital images provides a copyright comfort zone since SPIRO only displays thumbnail images, which have no commercial value, on the World Wide Web. High-resolution images are only available within the Berkeley domain.

Ironically enough, when we asked our other UC visual resources colleagues if they were interested in participating in a digital image grant project with Irvine and Riverside, Berkeley decided to jump in, even though they already had SPIRO. It was fortunate that they did since they could bring to this project the lessons learned from SPIRO along with the technological support of UC Berkeley's Museum Informatics Project (MIP).¹⁰ The three of us built upon the ideas behind SPIRO, researched other early digital projects, brainstormed, wrote the proposal, and received the grant—the Library of University of California Images, or LUCI for short, was born. The funding was an intercampus collaboration incentive program that came from the UC Office of the President.

LUCI was conceived as a searchable data bank of UC digital images in a universal format shared on the Internet. The first phase brought together 1,200 digital images of classical art and architecture from three campuses. The content decision was made by consensus amongst the partners and based upon the availability of material, copyright considerations, and faculty support.¹¹ These digital images and the associated textual description are accessible to the public in thumbnail format with the high-resolution images being reserved for UC campuses.

The intention is to allow the world access to our holdings and data, but to ensure that the high quality images are only available for the educational purposes of the University of California. A variety of applications for the use of these images have been developed, including but not limited to image study and research, instructional tutorials, classroom projection, and online catalogs.

The complex processes necessary for including images in a LUCI union catalogue were roughed out in this first phase.¹² Each campus identified appropriate visual materials, obtained permissions from the intellectual property holders if possible, and digitized the images by outsourcing 35mm slides to service bureaus for archival storage on Kodak Photo CDs. The digital images were color-corrected and adjusted in-house using Photoshop, then converted to a standard image file format agreed upon by the participants (i.e., 20MB TIFFs). The images were classified and cataloged in local collection management systems then the text-based descriptive records were exported into LUCI's union catalogue via Excel spreadsheets based upon the VRA Core Categories for Visual Resources. The Getty vocabulary tools, such as the *Art and Architecture Thesaurus*, were used for authority control and subject indexing. It should be noted that, in addition to the digital images, the same number of 35mm slides were procured, photographed, processed, cataloged, indexed, glass bound, labeled, and integrated into local UC visual resources collections, providing another level of archiving and access.

The digital images and textual worksheets were sent to Berkeley's Museum Informatics Project, where they were combined in the LUCI Sybase database and image repository. The textual data was provided to MIP on diskette and the digital images on JAZ disks; quality control and data consistency checks were made at this point. The Museum Informatics Project provided the following valuable assistance and support: the infrastructure and tools to manage the digital images; resource sharing across repositories; access to the images; a search engine; archival storage; advice about appropriate strategies, standards, and policies; and technological development services.

In 2000, the second phase of LUCI began with funding from the UC Institute for Research in the Arts. Since it was a thematic grant, a content leap had to be made from antiquity to California art and architecture, which now included both visual and performing arts images. As awkward as this was in terms of compatible content, it provided an opportunity for us to explore the potential of both California and UC-specific art works, such as campus architecture, public art, and the work of artists teaching on UC campuses. The participants expanded from the three who originally worked on LUCI to a total of seven UC campuses. The dispersed workload allowed for the inclusion of over three thousand additional digital images, but also increased the complexity of the project in terms of administration, communication, logistics, consensus building, and consistency in using standards and cataloguing conventions. The processes from the first phase of LUCI were refined and incorporated new advances in technology. For example, the use of digital cameras and in-house scanning prevailed over outsourcing, digital images could be sent via FTP to Berkeley rather than hand-delivered or sent by post, and associated textual data could be mailed electronically. An interesting quandary that had to be dealt with was how to handle digital art with no 35mm slide equivalent. Textual and graphical enhancements to the LUCI website were also an important part of this second phase.

The Museum Informatics Project then began a fruitful technological development collaboration with Luna Imaging Inc. resulting in the database being moved into the Insight® software.¹³ This software has enhanced LUCI by making the image database more functional for classroom use with features for convenient image selection, juxtaposition, zooming in on details, along with a variety of other innovations. This has positioned us well for obtaining additional digital content in Insight® through licensing or other collaborations and has transformed LUCI from a relatively static resource into something that can be actively manipulated.

Why Build It?

The LUCI project brought together disparate and unique image assets from seven University of California campuses into an accessible, central database creating a positive environment for collaboration along the way. Whether directly involved in the project or not, all UC campuses benefited from LUCI, and anyone else in cyberspace can access the information, albeit in a more limited way. Visual resources curators obtained valuable hands-on experience with technological innovations and were compelled to reflect on the complex issues related to

image database development, thus obtaining a more critical view of how visual technologies might be harnessed for educational purposes. The dispersed workload allowed us to pool resources and demonstrate the potential of collective efforts.

The content is useful to a variety of courses taught on UC campuses in the arts, humanities, and environmental design. UC access to high-resolution images and associated textual data provides flexibility in using the images depending upon scholarly orientation and pedagogical requirements. The enhanced functionality provided by Insight® software has increased faculty interest in using digital images for classroom teaching. In addition, the project has attracted the attention of UC administrative, library, and instructional technology staff. We also learned that the LUCI project could attract the support of other granting organizations and that the ongoing work of LUCI and MIP could be used to obtain matching funds. In the end, the LUCI project has demonstrated the great potential of centralized digital imaging and positioned UC visual resources collections well for future partnerships.

Construction Problems

LUCI has also posed a variety of challenges. The UC visual resources curators discovered how demanding the transition from slides to digital images could be, especially with the faculty expectation of retaining all of the analog services of the past as well. On the various UC campuses, the professional staff in visual resources collections available to work on both analog and digital projects ranges from one to four. However, the same staff has a wide range of other professional responsibilities requiring the additional support of temporary and student staff members to meet all these demands. Therefore, all of the grant participants struggled with issues related to administering, managing, and staffing the LUCI project. The majority of grant funds were used on personnel since other costs were easier to absorb with local budgets. We found that universities are much better at coming up with supplies and equipment than FTE.

Time was another challenging factor. Curators spent untold hours on LUCI project planning, developing data standards, locating and selecting visual materials, searching for appropriate documentation, communicating with potential contributors, obtaining permissions, hiring and supervising staff, processing and cataloging images, collaborating with technical staff, editing images and textual data, and exploring technological enhancements for the project. The grant funds were absolutely necessary to make LUCI viable, and consistent financial and administrative support is required to ensure future expansion.

On the technological front, the Museum Informatics Project provided crucial expertise and support without which LUCI would lack the technological infrastructure to move forward. There were a few technological stumbling blocks during the two phases of LUCI. For example, many collections found it difficult to export data from local collection management systems, which resulted in some cataloguing redundancy. Additional research on how to improve data migration is necessary. Better mechanisms for consistent image quality, joint authority work, correcting cataloguing errors, and adjusting tombstone information on thumbnails have been identified by participants as areas for future development. Extended database evaluation, assessment of usage, and follow-up improvements have become the starting point for a third phase of LUCI.

Did They Come?

Now that we had built it, it was time to ask, "Did they come?" The answer to this crucial question is generally *no*, with some instructive qualifications. After all of this work, a few faculty who specialize in Classical art and architecture added the LUCI website to their syllabi and referred the students in their courses to this online image resource. With the addition of the California content, a few more faculty and students became interested in LUCI.

Our available evidence, both statistical and anecdotal, indicates that usage of LUCI has been lower than anticipated. Using Analog software, the Museum Informatics Project runs reports regularly on the server hosting LUCI. For websites generally, the concept of a visit with a certain number of transactions does not make much sense because there is no concept of a user session. Software like Analog just counts requests and pages delivered. Consequently there is no record of individual visits to the LUCI website, however the data that has been collected is quite revealing. Since the second phase of LUCI came on line at the end of February 2002, the number of successful requests for the query page (the page from which all navigation is

conducted), database searches, thumbnail results pages, detail pages (individual thumbnail images with their identifying information), and large JPEG image files has averaged just over five per day or about 1,800 successful requests per year. Those searches that yield no results are not considered successful requests. But even figuring these in, the data cannot translate into an average of more than two to four visits to LUCI every day. Another telling statistic shows that successful requests for the large JPEG versions of LUCI images made from within the UC domain have averaged less than seven a month or about eighty per year.

It is interesting, too, that only 40 percent of all requests (when the server has been able to resolve the requesting address) have come from University of California campuses. In fact only 48 percent have come from educational institutions, as indicated by the .edu address extension. About 8.5 percent of identifiable requests have come from foreign domains, while 47 percent originated from .com, .org, .gov, and .mil domains. This imbalance, however, was not entirely unexpected.

All the statistics cited so far measure only Web browser access to the LUCI website on its MIP server. Yet LUCI is also separately available in the Insight® version on the UC campuses that participated in the second phase. We would expect that a substantial, if not the major, portion of LUCI use from these campuses would go to the Insight® version. Unfortunately, however, because LUCI in Insight® is currently conducted as just a demonstration project, MIP has not collected usage statistics.

Anecdotal evidence we have gathered from our UC visual resources colleagues tends to indicate, though, that Insight® statistics would not significantly alter the picture drawn so far. Some, but not all, of the UC curators have demonstrated LUCI in Insight® to campus faculty members. Although some instructors have expressed interest, the curators report they are unaware of any who have used it yet in the classroom or otherwise. In general, the curators are not aware of much local use of LUCI, whether in Insight® or via the website, nor do they report much derivative use of LUCI images, such as in course Web reserves. Except for those images that they own and contributed to LUCI, the various campus visual resources collections themselves confess to only very modest use of LUCI or its images. On the other hand, all this anecdotal material must be taken with a grain of salt inasmuch as the LUCI server statistics clearly show a level of UC campus use greater than that which the visual resources curators report.

Needless to say, the portrait of LUCI drawn so far is not what we had hoped it would be. To judge from server statistics, it is clear LUCI is being found and used by many individuals. The number is modest, though, and server reports show that most visits are relatively brief and do not mine the image repository in depth.

If usage is lower than expected and desired, what are the reasons? In the absence of a detailed survey of the potential user community, we can only offer conjecture based on the authors' experience and that of our UC colleagues. Our sense, though, is that we can separate the likely causes into two broad categories: content and technological readiness.

Regarding content, LUCI's limitations in both quantity and breadth are probably significant. It is, of course, self-evident that LUCI's relatively small size—just 4,500 images—is well below the critical mass of images required to teach art or architectural history. Were other digital resources available to faculty, perhaps LUCI would find greater use as a part of a mix of resources. However, to date the UC system has not licensed or provided campus access to any of the existing, large digital image collections in the arts, although some UC collections have contributed to projects such as the Research Libraries Group's Cultural Heritage Initiative.¹⁴

Still, this absence of a critical mass of teaching images does not in itself account for the relatively low use we observe. Equally significant may be the narrow range of subject matter covered in the collection and a distinct lack of connection between those subject areas. Because both phases of LUCI were funded through UC grant programs, its content development was very much driven by two factors: the specific thematic requirements of the grants and the nature of the copyright-unencumbered collections that grant participants could contribute. The first phase of LUCI, consequently, collected primarily ancient Greek and Roman art and architecture, while the second phase grant theme was contemporary California. Not surprisingly, several UC visual resources curators cited this limitation in their comments to the authors: there is no Classicist on

the faculty; LUCI's collection was not relevant to the existing faculty and curricula; LUCI's content did not overlap with the existing course reserves.

We believe LUCI's limited use to date can also be attributed to an unexpected but distinct lack of technological readiness on the campuses. Our UC colleagues commonly report either an insufficient digital classroom delivery infrastructure on their campuses or a low current use of existing "smart" classrooms. In fact, it seems still to be the case that few faculty members are engaged with instructional technology in the classroom. A larger number make use of digital course reserves, though still a minority it seems. We might also cite as technological impediments, although more minor in impact, the fact that LUCI's large JPEG images are only available via UC campus computers, that LUCI in Insight® is not available on all the UC campuses, and that Insight® is perceived as having a somewhat steep learning curve. These, though, are all road hazards but not roadblocks. UC curators must accept some of the responsibility, as well, for helping our faculty on the digital path. In our post-LUCI evaluations we identified this as a clear problem: we have not done enough to disseminate information or to excite faculty interest.

To summarize, a database with a hodgepodge of 4,500 digital images was not enough to satisfy the UC visual resources curators, much less the patrons of these image collections, who are used to walking into archives with hundreds of thousands of slides. Although critical mass or having a much larger number of images for LUCI was certainly an issue, the most frequent response to whether LUCI might be useful was, "But my stuff isn't in there." In other words, where is the contextual mass? This is a familiar song to the ears of visual resources professionals!

Since the University of California is a research-oriented institution with a tenure system rewarding research first and teaching second, we knew from experience that not only did we have to increase the number of images in the database dramatically, including our faculty's specific scholarly interests, but that interesting them in actually using the high-resolution images in the classroom, with concomitant training and time obligations, would require a great deal of effort on our part.

Remodeling

In 1997, when LUCI construction was in progress, University of California President Atkinson created a new UC entity—the California Digital Library. Described as a "co-library," the CDL was set-up as a collaborative venture with the ten UC campuses. Their focus is on digital materials and services with a mission that includes but is not limited to the following: (1) building, sharing, and preserving digital collections, (2) creating tools and services, (3) influencing and supporting innovation in scholarly communication, and (4) developing strategic partnerships for digital library development.¹⁵

One consistent collaboration has been with the Joint Steering Committee for Shared Collections (JSCSC). UC Librarians on this committee call for licensing recommendations twice a year from a variety of interested groups on all the UC campuses. The visual resources curators have provided suggestions for promising digital image content on a regular basis. One of the earliest recommendations was to license the Art Museum Image Consortium material for the UC system since our departmental budgets are too meager to be able to absorb the costs of licensing on such a grand scale.¹⁶ A dialogue with the CDL, art historians, visual resources curators, and art librarians began to discuss the potential of AMICO. A limited licensing agreement was made with AMICO, but it was a technological experiment that never provided local access to the images, and then it expired. However, the Associated Press Photo Archive was subsequently made available to us as result of this collaboration with the JSCSC and the CDL.

As the LUCI project grew, it started obtaining institutional attention, which provided some unexpected outcomes. The visual resources curators' annual summer meetings provided venues where CDL guests could join in on discussions and communicate about common interests. After the most recent of these, the CDL invited visual resources curators to participate in an experimental image service demonstrator project.¹⁷ Selected collections of digital images have been targeted for deployment in a centralized online service utilizing Luna Imaging's Insight® software. The goal is to amass about 200,000 images including visual material from the

Museums of the Online Archive of California, the Library of UC Images, other digital images from the UC visual resources collections, and licensed content from commercial sources. So far, Saskia, Ltd.'s digital images, with their excellent art historical survey coverage, have been licensed for this project. The demonstrator should then be of a size and complexity to assess future scalability along with the strengths and weaknesses of a centralized digital imaging model. Whether it will be transitioned into a sustained operational service will be dependent upon the results of the assessment built into the project and extended communication with stakeholders.

It is clear that the LUCI project was the tiniest drop in the bucket and a great deal more work is required to build on this centralized model for UC digital imaging. Yet, the learning experience and institutional acknowledgment alone were probably worth all of the effort since the visual resources curators are now actively involved in the UC system-wide dialogue about digital visual resources. Without LUCI and the proactive stance of the visual resources group, we can speculate that seven of the nine UC visual resources collections might have been excluded from this system-wide experiment, since they are not in UC libraries.

Throughout the project, we have also developed necessary infrastructures for the future. These would include: the technological infrastructure for housing and serving a consortial image repository; the processes and standards required for a shared image collection in a union catalog; and, solid internal communication systems, both formal and informal, based on a strong sense of partnership and group identity. In fact, despite the somewhat disappointing response to LUCI from faculty and students so far, the participants all feel the LUCI project has been a success and are eager to continue the collaboration.

We built it, but now we have the daunting task of engaging faculty and students in the use of digital images as well as to continue learning from these expanded LUCI experiences. Although slow in coming, the faculty and students are seeing the potential of digital images for research and instruction. The Insight® software has increased the functionality of the database and we are hoping that the additional content will bring in faculty and students in larger numbers.

Field of Digital Dreams

A visual resources curator could probably not ask to find themselves in better circumstances with such great potential for technological growth or for a more fortunate series of events, but it should be noted that both serendipity and hard work were involved in this process. Not to mention that, with the image service demonstrator project, we are not so much seeing the end of the LUCI project as a new beginning. We still do not know what the future holds, but just keep working towards it.

We also realize that most visual resources collections do not have the extensive resources of a state system to draw upon or even a logical collective group to rely beyond the vital Visual Resources Association.¹⁸ Yet, there are a number of important projects to keep our eyes on. One exciting development for visual resources curators has been the Mellon Foundation supported digital media initiative at UC San Diego.¹⁹ This two-part project involves the digitization of a significant portion of UC San Diego's substantial slide collection to expand the ARTstor collections and the Union Catalog for Art Images metadata partnership with Harvard and the Cleveland Museum of Art.²⁰ A project like this clearly benefits the University of California and these immediate partners, but also the extended field of visual resources.

These recent trends have encouraged the UC visual resources curators to reflect on many important issues related to digital imaging, something that we rarely have time for in our busy analog/digital day-to-day working worlds. We are hoping that this account of our experiences will provide you with food for thought too. A few of the trenchant questions that you might ask yourselves are as follows. If you were spontaneously asked for high-resolution digital images complete with the associated textual data for such a collective venture, how many would you have ready to provide? It appears that the UC visual resources curators have almost 80,000 ready to be used in the image demonstrator project, less than half of the total estimated in our first survey.

Not everyone is the keeper of material that might be of interest to digital cooperatives and we will all surely benefit from the work of other collaborative projects, but what about those spontaneous needs of your local patrons that reflect their scholarly specializations? Librarians and visual resources curators have been talking about ARTstor as if it will be the definitive

solution to all of our digital imaging challenges. It is a very exciting initiative for education, but how many of us are ready for ARTstor on the local level? Are we positioned to make the most of the images that ARTstor will provide?

Let us consider the contribution visual resources curators might be able to make in the area of digital visual resources. We see grassroots digital imaging projects and the visual resources curators who work with them as accomplishing the following:

- expanding upon the field's specialized image expertise to find and deliver images in educational contexts;
- building upon the contextual mass of images that faculty have specifically requested and will definitely use in their teaching and research;
- developing the potential for shared digital resources by experimenting with source data and developing cataloging standards to reduce the redundancy of the analog world;
- providing the traditional service necessary to meet localized needs and the spontaneous demands of faculty as well as expanding these services to include technology training and assessment;
- committing to preservation by transferring analog archival practices to the digital environment.

The LUCI project has shown University of California visual resources curators just how challenging the changing paradigm of analog to digital is, but we hope that you are reassured, as we are, that small-scale local efforts can make a difference. We know that what we have built is not yet complete and, yes, we are still waiting for them to come. Yet, based upon the rich experiences of LUCI, we encourage everyone who works in visual resources to explore the possibilities of this exciting transition to a digital world.

Notes

¹ The starting point for this publication was a paper entitled "Will Grassroots Digital Imaging Efforts Be In It For The Long Haul?" presented in a Visual Resources Association sponsored session called "Digital Museums and Pedagogical Utility: Transition, Experimentation, Delivery, and Infrastructure," at the 2002 conference of the Museum Computer Network in Toronto.

¹ See the following URL for more information about the SJSU Digital Art Project <<http://gallery.sjsu.edu/>>.

¹ See the following URL for more information about Art Images for College Teaching <<http://arthist.cla.umn.edu/aict/>>.

¹ See the following URL for more information about LUCI <<http://vrc.ucr.edu/luci/luci.html>>.

⁵ For two other good examples see California State University Image Exchange Library Online (CIELO) at <<http://cielo.calstate.edu>> and the Society of Architectural Historians Image Exchange at <<http://www.sah.org/imagex.html>>.

⁶ This was an informal survey amongst the UC Visual Resources Curators that was followed by a more official and recent survey developed by the California Digital Library and compiled by Christine Bunting at UC Santa Cruz. These were developed for internal use and have not been published.

⁷ Probably the best place to get to all of the University of California Libraries is to start at the California Digital Library web site at <<http://www.cdlib.org/about/faq/libraries.html>>.

⁸ See the following URL for more information about SPIRO <<http://www.mip.berkeley.edu/spiro/>> or Maryly Snow, "Spiro, A Visual On-Line Public Access catalog," *Computers and the History of Art* 7, (1997): 19-34.

⁹ For more information about fair use web sites see Maryly Snow's paper entitled "Digital Images and Fair Use Web Sites" at <<http://www.utsystem.edu/ogc/intellectualproperty/portland.htm>>.

¹⁰ The Museums Informatics Project supports a number of digital initiatives. See the following URL: <<http://www.mip.berkeley.edu>> for more information.

¹¹ For more information about the copyright conundrums of this first phase of LUCI see the article by Maureen Burns, "Noble Goals/Harsh Reality: Library of University of California Images and Current Trends in Copyright Law," *VRA Bulletin* 25, no. 2, (Summer 1998): 51-56.

¹² The creation of the union catalogue was described in detail in the following article by Maureen Burns and Madelyn Millen, "Lucivision," *VRA Bulletin* 25, no. 4, (Winter 1998): 80-84.

¹³ For more information about Luna Imaging, their software development and other available services, see the following URL: <<http://www.lunaimaging.com/index.html>>.

¹⁴ For more information about the Cultural Materials Initiative see the following URL: <<http://www.rlg.org/culturalres/>>.

¹⁵ For more information about the California Digital Library see the following URL: <<http://www.cdlib.org/>>.

¹⁶ For more information about the Art Museum Image Consortium see the following URL: <<http://www.amico.org/>>.

¹⁷ We would like to thank Laine Farley at the California Digital Library for her leadership on this image service demonstrator project and for being supportive of this publication.

¹⁸ For more information on the Visual Resources Association see the following URL: <<http://www.vraweb.org/>>.

¹⁹ For more information about the UC San Diego initiatives see the following URL: <<http://orpheus.ucsd.edu/slide/artsgr.html>>.

²⁰ For more information about ARTstor see the following URL: <www.artstor.org>.

Maureen Burns and Loy Zimmerman are co-curators in the University of California at Irvine's (UCI) Visual Resources Collection, responsible to the Schools of the Humanities and the Arts respectively. Burns has been in this professional position since 1993 with previous appointments in slide libraries at the J. Paul Getty Museum in Malibu and California State University at Long Beach (CSULB). Zimmerman has been at UCI since 2001, and previously at CSULB and the San Francisco Museum of Modern Art.

Both participated on the steering committee that planned the formation of a Southern California Chapter of the Visual Resources Association. Zimmerman was the first Chapter Chairperson and Burns was the local planning contact for the 1999 VRA conference in Los Angeles. At the national VRA level, Zimmerman served a term as Treasurer and is presently on the Development and Financial Planning Committees, while Burns is co-chairing the Awards and the Education Committees. Separately and in tandem, they have delivered and published papers on visual resources topics, including Chicago's conference session, "To Have and Have Not: Why Whistling Won't Work for Visual Resources Collections in the Digital Age."

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⁶ This was an informal survey amongst the UC Visual Resources Curators that was followed by a more official and recent survey developed by the California Digital Library and compiled by Christine Bunting at UC Santa Cruz. These were developed for internal use and have not been published.

⁷ Probably the best place to get to all of the University of California Libraries is to start at the California Digital Library web site at <<http://www.cdlib.org/about/faq/libraries.html>>.

⁸ See the following URL for more information about SPIRO <<http://www.mip.berkeley.edu/spiro/>> or Maryly Snow, “Spiro, A Visual On-Line Public Access catalog,” *Computers and the History of Art* 7, (1997): 19-34.

⁹ For more information about fair use web sites see Maryly Snow’s paper entitled “Digital Images and Fair Use Web Sites” at <<http://www.utsystem.edu/ogc/intellectualproperty/portland.htm>>.

¹⁰ The Museums Informatics Project supports a number of digital initiatives. See the following URL: <<http://www.mip.berkeley.edu>> for more information.

¹¹ For more information about the copyright conundrums of this first phase of LUCI see the article by Maureen Burns, “Noble Goals/Harsh Reality: Library of University of California Images and Current Trends in Copyright Law,” *Visual Resources Bulletin* 25, no. 2, (Summer 1998): 51-56.

¹² The creation of the union catalogue was described in detail in the following article by Maureen Burns and Madelyn Millen, “Lucivision,” *Visual Resources Bulletin* 25, no. 4, (Winter 1998): 80-84.

¹³ For more information about Luna Imaging, their software development and other available services, see the following URL: <<http://www.lunaimaging.com/index.html>>.

¹⁴ For more information about the Cultural Materials Initiative see the following URL: <<http://www.rlg.org/culturalres/>>.

¹⁵ For more information about the California Digital Library see the following URL: <<http://www.cdlib.org/>>.

¹⁶ For more information about the Art Museum Image Consortium see the following URL: <http://www.amico.org/>.

¹⁷ We would like to thank Laine Farley at the California Digital Library for her leadership on this image service demonstrator project and for being supportive of this publication.

¹⁸ For more information on the Visual Resources Association see the following URL: <http://www.vraweb.org/>.

¹⁹ For more information about the UC San Diego initiatives see the following URL: <<http://orpheus.ucsd.edu/slide/artsg.html>>.

²⁰ For more information about ARTstor see the following URL: <www.artstor.org>.