Title

One for Nine Ten: Cataloging for Consortia Collections, a UC model

Permalink

https://escholarship.org/uc/item/26p2d48s

Journal

Cataloging & Classification Quarterly, 56(2-3)

ISSN

1544-4554

Authors

Chin, Renee
Deng, Shi
Culbertson, Rebecca
et al.

Publication Date

2017-11-21

Peer reviewed

One for ~~Nine~~ Ten: Cataloging for Consortia Collections, a UC model[1]

Renee Chin, Rebecca Culbertson, Shi Deng, Kathleen Garvey-Clasby, Bie-hwa Ma, Donal O'Sullivan, Annie Ross

Abstract: In January 2000, the University of California created the Shared Cataloging Program (SCP). Based at the University of California, San Diego, the SCP is a "centralized cataloging model" for the California Digital Library consortium collections. This article will take an evolutionary look at the perpetual challenges of sustaining a consortial cataloging model and highlight the efforts of the SCP in the ongoing quest to eliminate the redundancy of efforts by centralizing the optimization of cataloging efficiency.

Keywords: Shared Cataloging Program (SCP), California Digital Library (CDL), consortial cataloging, centralized cataloging, batch cataloging, file distribution, Chinese e-resources cataloging, URL maintenance

---

Introduction

Over 200 library consortia worldwide are members of the International Coalition of Library Consortia (ICOLC), an informal organization whose mission is to share information about matters of mutual interest such as new online resources, pricing practices, and sharing of resources where possible between libraries. The majority of these consortia focus on academic libraries. One hundred twenty (59%) are from North America.[1]

There are many different models that consortia have used for cataloging. One lasting model is the Shared Cataloging Program (SCP), the centralized cataloging agency employed by

---

[1] The authors dedicate this article to the memory of Valerie Bross. Valerie was involved in the early planning stages of the SCP and the SCP Steering Committee (now SCP-AC). She served on the SCP-AC from 2008-2016 and played a key role in the development of UC systemwide cataloging policies and practices. Additionally, she co-founded the CONSER PURL project (2001) and helped implement the UC CONSER Funnel (2006), both of which continue to benefit the UC and the SCP.

the California Digital Library (CDL) for the ten campus libraries in the University of California (UC). This article continues where the French, Culbertson, and Hsiung article, "One for Nine: the Shared Cataloging Program of the California Digital Library" left off in 2002 and will focus on the SCP's commitment to cost-effectiveness for cataloging and maintenance tasks.

In October 1997, the UC Task Force on Electronic Resources (TFER) established a set of guiding principles that led to the creation of the SCP. These are still followed today:

- Emphasize ease of use for catalog users

- Expand access to the maximum while minimizing cost

- Conform to national cataloging policies

- Define a cataloging approach for electronic resources that works for the Melvyl® Union catalog but does not compromise local catalog integrity.[2] (See section on Cataloging Policies below.)

Established in January 2000, the SCP is a California Digital Library (CDL) funded program that began cataloging consortially licensed e-journals for the nine, now ten, University of California campus libraries. In 2003, the program expanded exponentially when it incorporated the cataloging of e-books and open access e-journals. The SCP's main responsibilities are to provide the timely representation of CDL-licensed materials or bibliographer selected materials in UC campus integrated library systems and the UC union catalog, Melvyl®; to maintain the currency of subscriber and coverage data; to eliminate the redundancy of cataloging efforts among the UC campuses; and to keep URLs current through the use of persistent identifiers.[3]

This article will focus on the approaches that have contributed to the SCP's longevity amidst an environment of ever-growing availability of e-resources, platform and URL changes, title deletions, title transference between packages, overlap of titles in multiple packages, and changes in technology and diminishing resources. Many of the future issues and challenges predicted by French, Culbertson, and Hsiung for the SCP in 2002 have come to pass. Over the years, the SCP has adapted to change with innovation and collaboration, meeting the demand

for processing and cataloging materials beyond e-journals to include not only resources of different bibliographic formats (e-books, conference proceedings, databases, audio, video) but also varying licensing models (open access resources, government documents, and Demand-Driven Acquisitions (DDA)), and even language-specific cataloging such as Chinese e-resources. Due to an increasing need to catalog Chinese e-resources the SCP hired a full-time Chinese language cataloger in 2007. This article would be incomplete without a discussion of the key factors that sustain a consortial cataloging program: lean organizational structure and staffing, carefully constructed cataloging policies, and the ability to adapt quickly.

Organizational structure

Effective communication is paramount to consortial cataloging. The SCP manages much of its work through remote collaborations occurring on a daily basis involving stakeholders at many levels (campus, local, statewide, national, and international). These collaborations require a myriad of communication methods spanning several time zones: within records, face-to-face, individual phone calls, conference calls (both online and phone), email, attendance at professional conferences, serving on national and international committees, and shared tools such as the CDL HelpLine, listservs, websites, blogs, and wikis. To understand the vital role that communication plays in everyday SCP work, it is necessary to explain the organizational structure by which the SCP functions.

The SCP is based at UC San Diego but reports to the California Digital Library (CDL) in Oakland, California. Organizationally, the SCP is part of the CDL Collection Development and Management Program, led by Ivy Anderson, the director and coordinator of the shared library collections on behalf of the ten University of California campuses. This program acquires scholarly content, manages UC's mass digitization efforts, organizes and supports shared physical library collections, negotiates and licenses shared digital materials for the UC libraries,

and provides and maintains catalog records for materials licensed by the CDL on behalf of the UC libraries.[4]

On systemwide issues, the SCP receives direction and guidance from the CDL Joint Steering Committee for Shared Collections (JSC) and advice from the SCP Advisory Committee (SCP-AC). The JSC advises the CDL Collection Development and Management Program Director on cataloging priorities and other decisions concerning systemwide shared collections. The JSC membership is comprised of representatives from the ten UC campuses, mainly Associate University Librarians and/or Collection Coordinators for collection management. To help the JSC make informed decisions, the SCP provides timetables and feedback on the feasibility of every cataloging priority decision. (See the section on Cataloging Priorities for more details.) In addition to advising the SCP on systemwide reactions to proposed cataloging policy and practice changes and related system issues including ILS, the SCP-AC offers continued guidance on cataloging issues. Its membership is comprised of catalogers, one from each of the ten campuses.

To prepare records for access and distribution, the SCP works in close partnership with other groups within the CDL Collection Development and Management Program, particularlyCDL Acquisitions (CDLA). The SCP is also part of the CDL Licensed Content Group and the CDL Electronic Resource Team (ERT). Serving on these two groups keeps the SCP informed during the various stages of the contracting process (proposal, negotiation, and licensing) which enables the SCP staff to research and plan in advance the most effective way to process an incoming e-resource package. The SCP may also work directly with vendors, particularly Chinese vendors, during the contracting process to acquire MARC records with specific metadata requirements and accurate title lists with persistent URLs. After a package launch, the SCP collaborates with CDLA, the ERT, and/or the SCP-AC to troubleshoot any potential or existing access problems discovered during the cataloging process related to cataloging, file distribution and processing, and proxy.

Lastly, the SCP is unique in that its base of operation is in a metadata services department located in a large academic library on the UC San Diego campus. The SCP staff work closely with UC San Diego staff to take advantage of their expertise and locally hosted training events (e.g., RDA and NACO training), to participate directly in decision-making that would impact both SCP and UC San Diego (e.g., sharing the same ILS), and to influence and drive UC and national cataloging policy and procedure to benefit UC and beyond. The original cost-saving motivations behind the creation of a centralized cataloging agency using "an existing cataloging unit"[5] spawned the ideal environment for the SCP to grow and evolve over the years. Overall, the SCP's symbiotic relationship with UC San Diego has played a major, though indirect, role in the SCP's continued sustainability and success.

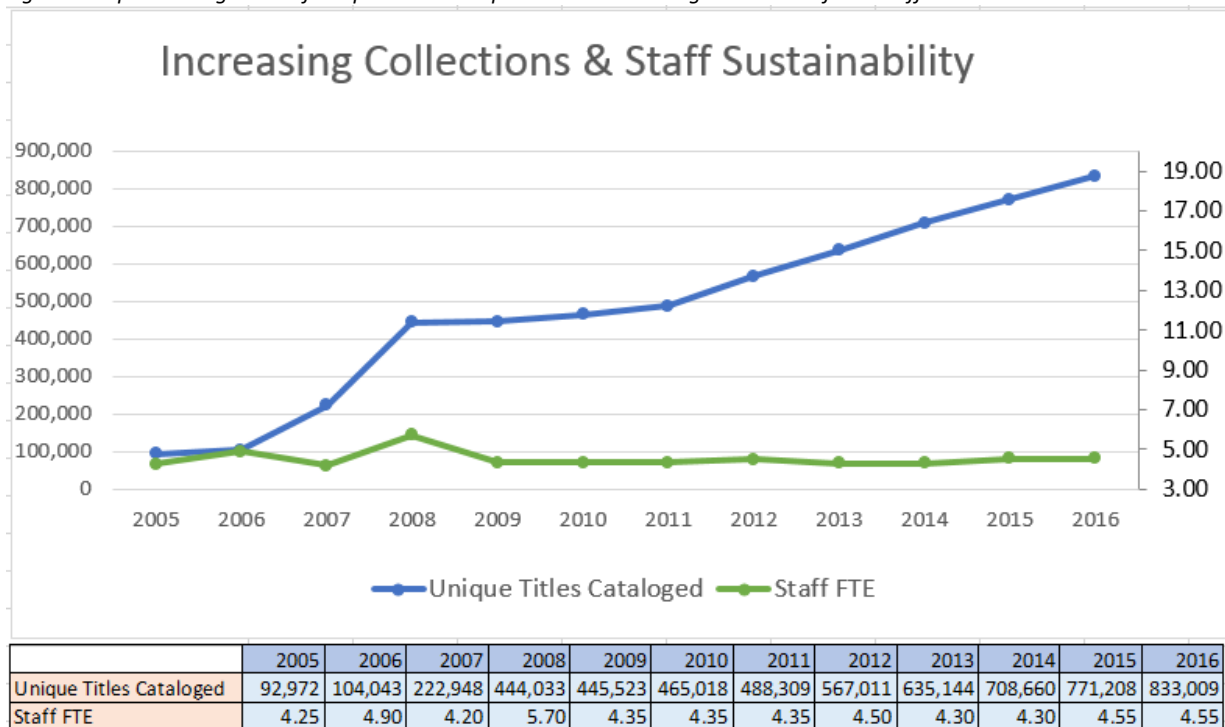*Figure 1. Shared Cataloging Program (SCP) organization flowchart.*

Shared Cataloging Program (SCP) Advisory / Policy Structure
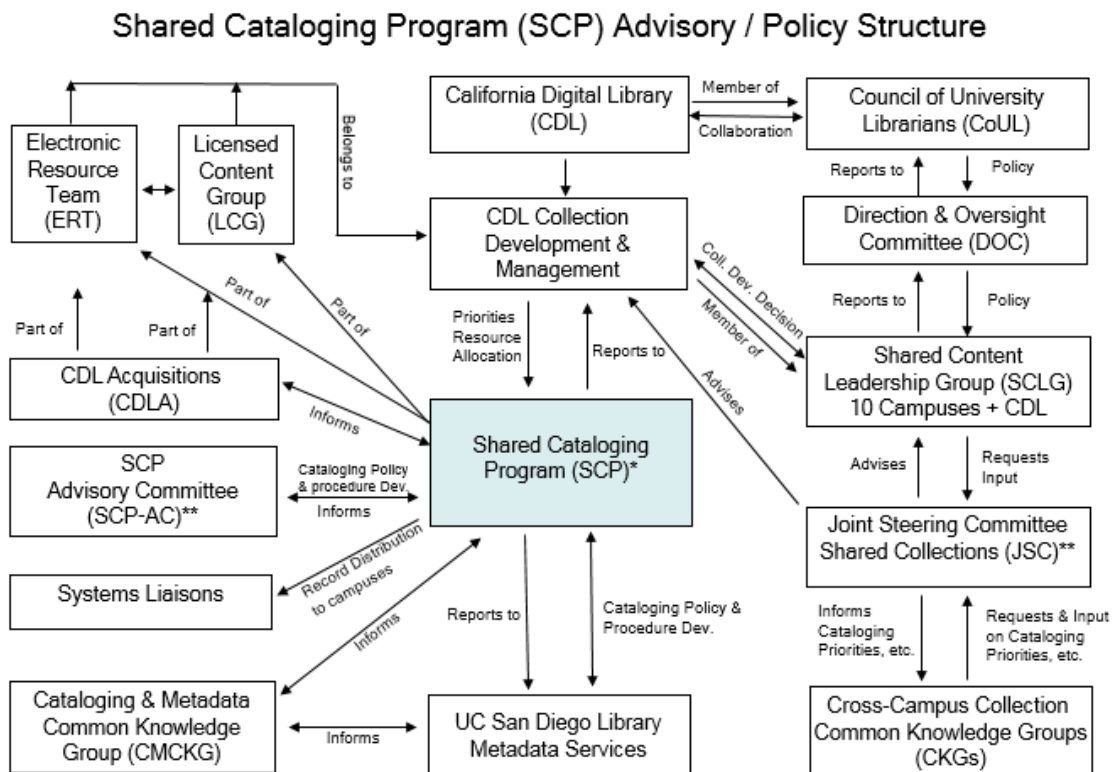
*Funded from CDL and system-wide Resource Sharing funds; based at UC San Diego Library Metadata Services
**CDL sponsored advisory committees

08.22.2003
Rev. 04.14, 2017

Staff Funding Models

The SCP operational workflows and organizational structure developed during the pilot project for record creation, maintenance, and distribution, have remained essentially the same while e-resource collections continue to grow exponentially in proportion to staffing. See Figure 2 below.

Figure 2. Exponential growth of unique titles[6] compared to the unchanged number of SCP staff.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unique Titles Cataloged	92,972	104,043	222,948	444,033	445,523	465,018	488,309	567,011	635,144	708,660	771,208	833,009
Staff FTE	4.25	4.90	4.20	5.70	4.35	4.35	4.35	4.50	4.30	4.30	4.55	4.55

The SCP started out with one FTE in 2000. Today, the SCP operation comprises 4.60 FTE including a 0.3 FTE manager.

There are two different funding models for the SCP FTE. All the SCP FTE are funded by the CDL except for the Chinese language cataloger position. The Chinese language cataloger position was initially created in 2007 and funded by CDL as a temporary measure to meet the request of the UC East Asian Bibliographers Group to catalog Chinese e-resources. After the first year, the position was jointly funded by nine UC campuses and the CDL[7] based on the CDL East Asian cost share model for collections. The position became permanently funded in 2014

and continues to remain jointly funded. Where there is a need and demand, pooling funds from the ten UC campuses has proven to be a viable cooperative strategy for the greater good.

Cataloging Policies

From the beginning, the SCP's mission has been to provide a centralized approach to record cataloging, maintenance, and distribution with an emphasis on eliminating redundancy of cataloging efforts to achieve time and cost savings for all involved. One early challenge was the promotion and establishment of standards that would maximize access for MELVYL® users while recognizing the strengths and limitations of local systems and avoiding requirements that would compromise their functionality.[8] This goal was achieved and continues to be achieved through agreement by the SCP-AC on UC policy and cataloging standards that eliminate the need for any customization or accommodation of the various campus ILSs and local practices.[9] The campuses accepted and agreed to the following three cataloging policies as a means to carry out the aforementioned mission:

1. Adoption of a standard for cataloging electronic resources: To facilitate and support full record cataloging and ongoing maintenance, the SCP adopted the single record approach to promote consistent record merging and enable the campuses to load SCP records into their local catalogs with little human intervention. This policy was later amended to apply to e-journals only. The SCP adopted the separate record approach for cataloging e-books in 2003, as the scale for the manual work required by the single record approach became untenable. The separate record approach also made it possible to utilize automated techniques to expedite the availability of the resources and to support maintenance efforts of campuses choosing to withdraw print collections in favor of online ones.

2. The use of persistent URLs: With a centralized link resolver, URL maintenance is performed only once (by the SCP) instead of ten times, thus relieving the campuses

of the major burden of local URL maintenance. See section on The Challenge of

Persistent URLs and URL maintenance below.

3. Distribution of entire MARC records: To save time and further reduce manual efforts

in the area of record maintenance, the SCP distributes the entire OCLC MARC

record to the campuses whenever there is a change to a record (e.g., title changes,

URL fixes, and coverages updates, etc.). The OCLC control number is the load

match point and a 599 MARC field with a standardized note is added to the record to

indicate whether the record contains an addition, change, or deletion in description.

The campuses handle each category of change as permitted by their workflows.

Cataloging Priorities

When the SCP was established in 2000, its primary goal was to provide bibliographic

access to consortially licensed e-journals for the UC campuses. As the campuses grew to

increasingly depend on the SCP, the program expanded to include online databases, e-books

(including online audio and video), online government documents, open access resources,

Chinese e-resources, and most recently DDA e-resources. The rapidly growing collections

generated an increasing demand to provide timely access to all types of e-resources, regardless

of licensing model, adequate resources, or adequate staffing.

The SCP cataloging priorities were initially determined almost exclusively by the SCP

staff, with limited input from CDL and the other campuses. In response to ever-increasing

workloads caused by a sudden explosion of e-book packages and request to catalog other

types of e-resources during FY 2007-2008, the CDL established a more formal process to

prioritize cataloging needs with the goal to balance and prevent unnecessary cataloging delays.

To facilitate this process, the SCP submits a quarterly report to the JSC which outlines the

SCP's proposed cataloging priorities for the coming quarter. The JSC sends the report to

various UC Common Knowledge Groups (formerly Bibliographer Groups) compiling feedback used to approve and adjust priorities as needed and requested.

Two categories of priorities are included in the report: standing and project-oriented. The standing priorities are general in nature and do not necessarily target specific e-resource packages. Reviewed annually by the JSC, the standing priorities are overarching and defined by categories such as licensed materials, new additions to existing licensed packages, open access resources, and ongoing maintenance of existing e-journal packages (transfers, content changes, etc.). The project-oriented priorities are specific in nature and may be triggered by newly licensed packages or significant backlogs of existing packages. Project-oriented priorities may also be identified by the SCP staff, or requested by the campuses in response to internal or external factors. Project-oriented priorities are not fixed and may get bumped and moved around depending on the standing priorities or in response to changes in other packages.[10]

The general principles of the standing cataloging priorities set by the JSC dictate what gets cataloged first: licensed materials (databases, e-journals, e-books, in that order) before open access materials, current/new titles before older titles, and "first in, first out" when there are competing needs within the same category.[11] In daily practice the priorities driving the work are a combination of standing and project-oriented ones. Cataloging work benefiting greater numbers of campuses tends to get a higher priority.[12]

E-journals cataloging

Licensed e-journals were the first category of e-resource cataloged by the SCP and e-journals in general continue to receive the highest cataloging priority. Cataloging is provided for standard subscription packages, titles in aggregator databases, and requested open access e-journals. In addition to providing records for new e-journal titles, the SCP maintains and distributes updates to e-journal records for changes such as coverage updates and the addition of new providers.

The process for cataloging and providing records for e-journals has changed little since the SCP's inception. E-journals are still cataloged using the single record approach and package-specific metadata[13] is supplied automatically to each record during the process of cataloging.

In addition to new cataloging, the SCP also performs bibliographic maintenance on existing records. E-journals maintenance constitutes the majority of the SCP e-journals cataloging workload. It started out as a manual process, became a cooperative effort with the establishment of the UC CONSER Funnel in 2006 (see section on UC collaboration and beyond below), and recently, gained an automated component. In spring 2014, the SCP began using the Daily Update Report service offered by the OCLC WorldShare Collection Manager to maximize and facilitate e-journals maintenance and updates to CONSER and other serial records. Based on a specific profile, the SCP receives a daily file of records with additions, updates or deletions to the specific MARC fields in the master record as well as changes to the encoding level, date/publication status changes, 040 to include 040 $e rda, and OCLC control number. Control number and date/publication status changes are processed manually. Control number changes require redistributing the records to the campuses with a 599 DELete note for the record with the old OCLC control number and a 599 NEW note for the record with the new control number. Date/publication status changes usually require adjustment/closing out the holdings and title change processing. Using the OCLC WorldShare Collection Manager and title change lists from the aggregators (especially EBSCO), the SCP staff can update e-journal records with efficiency and accuracy often before these changes appear in other sources such as the SFX link resolver. Other e-journal changes are processed in batch and entire MARC records are overlaid and re-sent to the campuses in the weekly SCP files. Furthermore, after each batch overlay, the SCP staff check for any local records with an active date status that don't match the current ceased date status (usually status changes prior to 2014), catching older title changes that fell through the cracks due to former, less reliable manual processes.

E-books cataloging and batch processing

In terms of evolution, the history of SCP cataloging can be characterized as steady and consistent for the first eight years with both e-journals and e-books being cataloged one by one, using the single record approach. The increasing availability of e-books, open access resources, and DDA programs forced the SCP to adapt and reinvent its workflows leading to the development and exploration of a diversity of cataloging techniques.

In the early 2000s, e-journals cataloging took center stage amidst a burgeoning e-journal publishing industry. At that time, e-book publishing had not yet taken off. As a result, e-book records were not yet readily available in cataloging utilities such as OCLC so manually checking every detail (e.g., matching ISBNs, URL verification for e-books was still manageable and desirable. This comfortable cataloging pace and process incontrovertibly changed in FY 2008-2009, with the simultaneous occurrence of several events: the SCP began cataloging and distributing records for online California state documents,[14] the loss of 1.35 FTE, a sudden deluge of e-books, and the implementation of the provider-neutral record for electronic monographs. These events, along with changed cataloging priorities, were the catalysts that precipitated the innovation and creativity behind the batch processing techniques that have become one of the mainstays of SCP e-book cataloging.

As early as 2006, the SCP began exploring new OCLC search commands/indices and algorithms to achieve accurate record identification and retrieval en masse. Search strategies were very important in early batch techniques predating the provider-neutral record for monographs. Before the OCLC WorldShare Knowledge Base, records in collections may have been available in OCLC but identification and retrieval were time-consuming to perform on a one-by-one basis. For over a decade, SCP had an active partnership with OCLC to produce records for OCLC WorldCat Collection Sets. (See also the section on UC Collaboration and Beyond.) Using search retrieval techniques, the SCP identified and cataloged records that

OCLC then packaged as collections to make available to the larger library community. Adding to search strategies, the SCP staff created complex OCLC macros using OCLC Macro Language (OML) to manipulate and customize metadata and batch export records for distribution, automating much of the SCP's cataloging workflows from the basic to the advanced. By 2008, these techniques paved the way for the SCP's first successful experiment in batch cataloging, the creation of a workflow to harvest and distribute current online California state documents to the UC campuses.[15] Using the original guiding principles of the SCP as its underpinnings, the SCP came up with an improved process to continue the timely representation of CDL-licensed materials or bibliographer selected materials in UC campus integrated library systems and the UC union catalog, Melvyl®,[16] striving to do more with less.

In August 2009, the implementation of the provider-neutral record for monographs broke new ground for innovation in e-books cataloging. Given the difficulties and time-consuming nature of cataloging and identifying separate records for each provider, the original standard of one-by-one cataloging became unsustainable with the sudden influx of thousands of e-books. The provider-neutral record for monographs, however, finally made it possible to take advantage of batch cataloging techniques by facilitating record merging of duplicate records, thereby promoting a more consistent standard for cataloging e-books. In just six years, after a reorganization of the SCP responsibilities and priorities and the formation of a working group to create and evaluate procedures for every publisher/vendor, the SCP progressed from cataloging a couple of thousand e-books a year to over 50,000 e-books a year. The SCP's first successful batch processing project was documented in a NASIG poster session entitled, Weapons of Mass Distribution: Cataloging with Deadly Efficiency.[17] Using a combination of vendor supplied metadata and title lists, customized OCLC search algorithms, complex OCLC macros, and the new addition of the all-important MARC editing utility, MarcEdit, the SCP staff derived original English language e-resource records from equivalent manifestation OCLC records (all formats and languages) using looping macros that were so accurate and efficient

that little post-cataloging was needed prior to record distribution. These macros and other batch processing tools improved upon the ones previously developed for processing the online California state documents and effectively reduced the e-book cataloging workload from thirty hours/week to a mere three hours/month.

To fully understand and appreciate the significance and magnitude of the SCP's batch processing methods, it is important to highlight a few key points. The SCP successfully adapted and employed batch processing techniques at a time when vendor records were not available. In the past few years, the advent and availability of vendor records have given libraries the ability to load thousands of records unchecked into their catalogs with a promise of efficiency and accuracy. The lure of using vendor records has not escaped the SCP's attention. The SCP did utilize proprietary vendor records for at least one early e-book collection and free vendor records have been used to derive OCLC records for a couple of other collections. The SCP continually and proactively explores the use of vendor records but finds, in most cases, that it is necessary to catalog and distribute OCLC records to the greatest extent possible.

Since 2009, the UC Libraries discovery platform and union catalog, Melvyl®, has been powered by OCLC WorldCat Local. As a result, the importance of using OCLC records for record distribution and re-distribution to the campuses is ten-fold and has significant implications for the future. The main problem with using vendor records is discovery. Static vendor records are ideal for *individual* local catalogs because they can be loaded and forgotten. At the consortial level, with a union catalog powered by OCLC WorldCat Local, using vendor records is disadvantageous on several levels. Since only OCLC records are discoverable in Melvyl®, UC inter-library loan services and campuses using Melvyl® exclusively as their discovery system would not have access to resources through vendor records. Libraries would be forced to use individual library catalogs as siloes to identify which campuses owned a particular title. Vendor records can also be costly and proprietary which limits their flexibility and restricts their use (e.g., they cannot be uploaded into OCLC). Unlike static vendor records, OCLC records are

continuously updated and OCLC participants can use WorldCat Updates offered through OCLC's WorldShare Collection Manager to set up specific profiles to automatically receive record updates and changes. OCLC records are maintained in real-time in the union catalog and the SCP distributes the record updates to the campuses for their local catalogs.
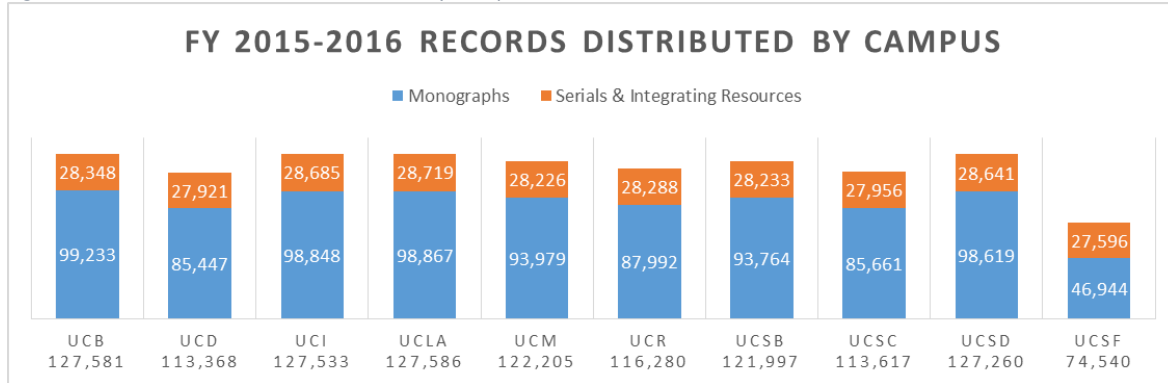
Even though the direct use of vendor records is problematic, the SCP catalogers do take advantage of them (and other sources such as the OCLC WorldShare KB) as tools for extracting pertinent metadata to complement and supplement existing SCP batch processing tools and techniques. For example, the SCP staff often use MarcEdit to extract a list of ISBNs or ISSNs from vendor records (in the absence of publisher title lists) to batch search records in OCLC.

The decision to use and distribute OCLC records exclusively is a testament to the foresight and forward-thinking minds of Crystal Graham and Patricia French (then at UC San Diego and UC Davis, respectively), as well as others, architects of the initial cataloging policies in 1997 to eliminate the need for any customization or accommodation of the various campus ILSs and local practices.[18] Metadata staff spend the majority of their working hours designing, maintaining, and upholding consistent cataloging and bibliographic description standards for a good reason. Vendor records lack the consistency and standards compliance that are necessary for ease of identification, searching, access, maintenance, and description (see section on Chinese cataloging below for the problems caused by inconsistent metadata and standards). Since OCLC is the UC's exclusive and preferred cataloging utility, using OCLC records allows the SCP to maintain a consistency and standard that becomes even more important in the face of ILS changes, record migration, a new discovery system, and the implementation of new concepts such as BIBFRAME and linked data. This consistency will promote the interoperability and flexibility of converting, storing, and indexing SCP managed metadata in a new system. These policies were not developed in a vacuum--it is essential for

the campuses to be able to rely on the consistency and standard of quality expected of SCP distributed consortial records in order to keep moving forward.

Figure 3. FY 2015-2016 Records distributed by campus

FY 2015-2016 RECORDS DISTRIBUTED BY CAMPUS

■ Monographs ■ Serials & Integrating Resources

	UCB 127,581	UCD 113,368	UCI 127,533	UCLA 127,586	UCM 122,205	UCR 116,280	UCSB 121,997	UCSC 113,617	UCSD 127,260	UCSF 74,540
Serials & Integrating Resources	28,348	27,921	28,685	28,719	28,226	28,288	28,233	27,956	28,641	27,596
Monographs	99,233	85,447	98,848	98,867	93,979	87,992	93,764	85,661	98,619	46,944

UCB = UC Berkeley, UCD = UC Davis, UCI = UC Irvine, UCLA = UC Los Angeles, UCM = UC Merced, UCR = UC Riverside, UCSB = UC Santa Barbara, UCSC = UC San Cruz, UCSD = UC San Diego, UCSF = UC San Francisco

Though the majority of e-books are processed in batch, a few select titles and packages may be cataloged manually if original cataloging is required or value added metadata is requested. There is, of course, give and take with the batch processing of records. The SCP staff don't have the time to look at each record, check every URL, and ensure that every record is perfect before being distributed to the UC campuses. The SCP consists of 4.60 FTE doing the collective work of 10 cataloging agencies.

The SCP continues to explore strategies for applying batch processing techniques in all areas including e-journals and maintenance. Beginning with the FY 2015-2016, the SCP began processing the OCLC daily reports for monographs. Monographs present unique maintenance challenges. Due to the implementation of the provider-neutral record for monographs, the OCLC community merging project, and the vast number of duplicate e-monograph records being created and uploaded by vendors, there are often a large number of control number changes due to record merging. Because the OCLC control number is the load match point, the SCP does not process all these changes. It would require redistributing 2 sets of records (DELetes and NEW titles) to the campuses. The SCP is investigating the use of batch processing techniques to make this maintenance process more manageable pending approval from the

campuses. Other types of updates, such as upgraded K-level records containing desired added subject headings, are automatically distributed to the campuses.

Overall, using the OCLC daily reports has helped the SCP deliver better-quality records to the ten UC campuses on a weekly basis. The total number of all records distributed to the UC campuses in the last five fiscal years has vastly increased due to processing the OCLC daily updates for both e-journals (2014) and monographs (2015). When medical subject (MeSH) headings were deconstructed in 2016, the daily update files were helpful in identifying and updating the thousands of monograph and e-journal records that were changed.

Cataloging Chinese E-resources: A New SCP Venture

In fall 2007, the SCP embarked on a new cataloging venture and hired a full-time Chinese language cataloger to address the growing plethora of CDL licensed Chinese e-resources. Though the Chinese digital publishing industry produces content at astronomical rates, Chinese e-resource cataloging is still given low priority or is nonexistent in North American libraries. As a result, very few Chinese e-resource records exist in cataloging utilities such as OCLC, and in vendor knowledge bases.

Misconceptions about the need for cataloging Chinese e-resources have also been problematic, with many libraries accepting vendor records, promoting the keyword searching capabilities of databases, and believing (erroneously) that discovery layers[19] are the answer to accessing all e-resources. The typical cataloging practice for East Asian e-resources involves library systems staff without language expertise loading vendor or knowledge base supplied records and metadata into local catalogs. Unfortunately, the low priority given to Chinese e-resources in general, combined with a historical lack of staffing, and blind faith in vendor records has had a snowball effect on the entire Chinese digital publishing industry leading to rampant inconsistent metadata practices.

The SCP discovered early on that Chinese e-resources shared the same challenges and issues that all e-resources do, *and more.* Chinese e-resources cataloging suffers from substandard and unreliable vendor-supplied metadata,[20] inconsistent description standards, inconsistent Pinyin word division standards, erroneous transcriptions (simplified vs. traditional characters), duplicate records (result of bad metadata and content presentation issues), hybrid records (Chinese notes in records described in English), and non-persistent linking, with an added layer of politics and cultural differences. These everyday issues become overwhelming and magnified because they often present themselves together at the same time—it's never just *one* problem. Poor quality metadata and inconsistent standards and practices render metadata conversion more difficult, cause linking errors and failed searches, and further propagate inaccurate and duplicate bibliographic records, all of which brings the cataloging process to a grinding halt. To make use of metadata in Chinese vendor records, the SCP must apply complex batch processing techniques to first clean up the bad metadata. At the most basic level, the scripts in a set of Chinese vendor records must be compared and verified against the character forms (traditional or simplified) on the resources themselves and corrected as needed to ensure proper identification and valid search results. Romanized forms require yet additional manual manipulation to standardize the metadata. The perpetuation of inconsistent standards can detrimentally affect something as basic as a title search, affirming the importance of accurate metadata and the need to maintain consistency and standards for records. The cleaned-up metadata is used to search copy or create original records in batch for upload into OCLC where they are available for discovery by the international library community and the UC campuses via the UC Union Catalog, Melvyl®.

The SCP recognized that cooperative cataloging and collaboration would be the gateway through which to start remedying the colossal problem of Chinese e-resources cataloging. Chinese language catalogers could lead the way in bridging the gap between East Asian studies librarians, vendors, systems, link service providers, publishers, bibliographic

service agencies, discovery services, and other stakeholders in the supply chain. The SCP has also taken a proactive role in establishing the CEAL Task Force on Metadata Standards and Best Practices for East Asian Electronic Resources (CEAL ERMB Task Force), a national initiative for working with Chinese vendors to improve their metadata and promote best practices with the goal to identify and improve the presentation and metadata issues that affect e-resources cataloging efficiency. The CEAL ERMB Task Force helped launch the China-U.S. Translation and Research Collaboration Project on Electronic Resource Standards and Recommended Practices in the United States, an international project to translate and promote NISO standards and best practices for cataloging Chinese e-resources into Chinese for international constituents. Opening the channels of communication was the first step towards establishing trust between libraries and vendors to ensure that business activities would be mutually beneficial to all stakeholders. Efforts are starting to pay off as UC librarians have succeeded in including metadata standards requirements for two Chinese DDA licensing agreements[21] and in conveying and promoting the importance of including title changes in title lists. The largest Chinese journal vendor recently agreed to provide this service, ending a decade long issue of contention between UC librarians and Chinese vendors. Hopefully, with the largest Chinese vendor leading the way, smaller vendors will follow suit. For further discussion on the SCP Chinese cataloging collaborations, see the section on Collaborations at UC and Beyond below.

Weekly file maintenance and distribution

The SCP distributes records on a weekly basis to the ten UC campuses. The SCP record distribution process was first documented in 2002,[22] and while the fundamental elements of it have remained fairly stable since then, there have been a few adjustments.

The SCP records live in UC San Diego's local integrated library system (ILS) and are differentiated from UC San Diego's records primarily by a unique location code. The first major

change was the addition of e-books to the e-journals workload which necessitated a split in files based on format, increasing the number of files from nine (later ten) files to 20 files per week. In the early days of the SCP, most records were "cloned" one-by-one from existing UC San Diego records, but with the employment of batch processing tools, most records are now loaded twice into UC San Diego's local catalog: once for UC San Diego (if they are a participant in a package) and once for the SCP, with subsequent record updates occurring one-by-one or in batch overlay. The entire bibliographic MARC record is still distributed whenever it is newly added, changed or deleted, with a MARC field 599 communicating the nature of the record being delivered. Receiving libraries can sort and organize the records based on the note in the 599 field:

599 NEW—Newly distributed records. Example: 599__NEW $c 170328

599 UPD—Changes to already distributed records. Example: 599__UPD $b cat $c 170328 (indicates a bibliographic change to the record)

599 DEL—Deletion of a record. Example: 599__DEL $c 170328.

Other special local fields that are important in SCP records include:

793—Package title hook (local). Example: 793 0_Cambridge online journals or 793 0_ MIT Press online monographs

920—Participating campus fields. Example: 920 UCB

Example of a SCP MARC record with 599, 793 and 920 fields:

Figure 4. Sample SCP MARC record with 599, 793, and 920 fields.

At the start of each week, the SCP file processor searches and gathers all SCP bibliographic records flagged with 599 fields from the prior week. Separate files of MARC records are created for SCP monographs and e-journals using saved batch searches. The SCP monographs and e-journals files receive several quality control checks (such as records that lack a URL in the 856 field or a SCP-approved title hook), and are corrected accordingly. The monographs and e-journals files are then uploaded to the SCP file server where they are separated into a relevant monographic and serial file for each campus based on the 920 fields in the records. Consequently, the campuses only receive files of titles for which they are entitled, indicated by the presence of at least one 856 field in the MARC record. Each campus then accesses the SCP file server at UC San Diego to obtain their own files.

The distribution process represents a consistent workload for the SCP and the campuses. With increasing workloads that must be absorbed by existing staff, the SCP continually explores ways to make not only cataloging but also record distribution more time-

saving and cost-efficient. In July 2011, the UC Systemwide Operations and Planning Advisory Group (SOPAG) established the Power of Three (POT) working groups that were charged with assessing and formulating systemwide actions and policies for implementation of the Next Generation Technical Services Initiative.[23] The POT5 group was charged with the responsibility to "maximize the effectiveness of Shared Cataloging" and its first task was to "assess the benefits and risks of stopping the distribution of (SCP) bibliographic records to the ten campuses for their local OPACs." Would the elimination of the record distribution workload result in SCP/campus cost and/or staffing savings sufficient to offset, if any, negative impacts of the SCP not distributing the records to the campuses?

To accomplish this, POT5 and the UC Cataloging and Metadata Common Interest Group (CAMCIG) investigated the following two issues: 1) Determine the staffing and service impacts on UC libraries if the SCP discontinued record distribution to the campuses, and if campuses chose to add the records themselves, and 2) Determine the economic impact of the current record distribution process to both the SCP and the campuses, and identify alternative methods for record distribution and loading, and their cost.

POT5 surveyed four UC campuses to find out how they used SCP records and the impacts on library services if SCP record distribution were eliminated. Survey results revealed that SCP records were heavily used for reference and instruction, collection development, interlibrary loan, acquisitions, cataloging, and circulation activities. Public services used SCP records as sources for persistent URLs to add to LibGuides and other instruction materials and to assist with collection development (to verify if titles were owned before placing orders or to make preservation decisions about withdrawing print collections). Inter-Library Loan departments relied heavily on SCP records and their elimination would have detrimental impacts on ILL revenue, staff time (redundant searching in multiple systems), and workload (unnecessary borrowing requests and orders from within and outside UC). Acquisitions departments used SCP records for creating lists to track titles moving in and out of CDL

licensed packages and help identify print titles for cancellation. In addition to the above,

eliminating the distribution of SCP records would create work redundancies for the campuses,

inhibit user discovery of and access to CDL e-resources, and reduce the ability of libraries to

deliver quality user services.

The economic ramifications of eliminating SCP record distribution were equally

compelling for maintaining the status quo. Findings revealed that the total cost of distributing a

single record to the ten campuses was slightly less than 50 cents per record. For FY 2010-2011,

the total cost of distributing SCP records to all campuses was $31,887 (the SCP cost was

$5,162 and the remaining $26,725 share was distributed amongst the campuses). The total FTE

involved in the process for all campuses was .642 FTE for distribution and loading of records.

CAMCIG further examined the costs and benefits of using other methods for the

campuses to acquire, load, and access SCP records: UC San Diego catalog via Z39.50, OCLC,

and Melvyl®. They determined that none of these options was feasible or cost-effective and the

cleanup efforts and costs associated with changing the process would be absorbed by the

individual campuses making these options even less desirable. By the conclusion of the study,

none of the UC campuses could identify benefits to the elimination of record distribution by the

SCP. Given the low cost and high quality of the SCP's records and file distribution method, the

unacceptable alternative of using Melvyl® as the sole discovery system for CDL e-resources,

and lack of cost benefit or work efficiencies associated with alternative methods, the CAMCIG

recommended continuing the SCP's current operation for record distribution.[24]

The SCP has continued to search for alternatives to record distribution, in particular the

OCLC WorldShare Collection Manager and OCLC Knowledge Base (OCLC KB), since OCLC

WorldCat is the backend database that feeds Melvyl®. In 2014, the OCLC WorldShare

Collection Manager offered improvements and features not previously available. The SCP

started experimenting with the idea of using the OCLC KB for record distribution and evaluated

its feasibility based on the following questions: Does the OCLC KB include records for titles in

all the packages managed by the SCP, including CDL selected open access packages? If not, what is the feasibility of adding records for titles in CDL packages not represented in the OCLC KB? Can this process be automated or does it require manual processing? Time-wise, how would this process compare with current SCP record distribution? Can package activation be done at the package level for CDL selected titles or will the titles need to be manually activated? Do all the titles in the OCLC KB have OCLC WorldCat record numbers? What if the OCLC numbers in the OCLC KB do not match the control numbers in existing SCP records? Is there a way to set differentiated OCLC holdings for CDL licensed and selected open access resources at the campus and consortial levels? What are the workload and cost implications of switching to and using the OCLC KB for SCP record distribution? Would the CDL and the UC be able to support the additional cost(s)? After a lengthy review, the SCP determined that the OCLC KB was not yet a viable alternative to the SCP record distribution process.

The longevity of the SCP record distribution process is another example of the foresight of the founders of the SCP who hit upon a fairly simple solution of consortial record distribution that (with a few tweaks) has persisted in light of staffing, economic, and technological changes.

The Challenge of Persistent URLs and URL maintenance

- 2000—Implementation of the CDL PID server, supported by open-source OCLC PURL software.
- May 2001--CONSER PURL pilot project proposed for cooperative maintenance of URLs (also known as BibPURLs) for open access resources on OCLC records maintained by CONSER institutions.
- July 25, 2002—Implementation of the CONSER PURL server with participation extended to BIBCO members: http://bibpurl.oclc.org/.[25]
- October 3, 2005—Established linking guidelines for SCP cataloged e-resources.[26]

- July 1, 2006—Implementation of ExLibris SFX link resolver at CDL. The SCP staff began using SFX OpenURLs for linking licensed e-journals.[27]

- 2007--Introduction of PURLZ (Zepheira), the new replacement for the OCLC PURL software. Attempts to migrate PID data and upgrade to PURLZ unsuccessful.

- July 2008—The SCP began cataloging and distributing records for online California state documents encouraging extensive use of the CONSER PURL server.[28]

- 2009—E-book publishing takes off and for the first time in its history, CDL licensed more e-books than e-journals.

- July-October 2013--Brian Riley, programmer at CDL, worked with the SCP to design a custom in-house link resolver to replace the aging PID server.

- November 2013—Implementation of the new CDL PID server at http://uclibs.org/.

- December 2015—Established linking guidelines for SCP cataloged licensed e-books promoting use of SFX OpenURLs, DOIs, ARKS, persistent publisher provided URLs, or PIDs.[29]

- November 2016—The SCP began cataloging open access e-book collections

One of the hallmarks of the SCP is the link resolution and maintenance service it provides to the UC campus libraries for UC selected e-resources. Since the implementation of the CDL PID server in 2000, the SCP's commitment to URL persistence has been constant and vigilant, its direction guided by several distinct events: The implementation of the ExLibris SFX link resolver, a CDL proposal to include the cataloging and distribution of open access resource records in 2006,[30] the introduction and influx of e-books in 2009, an aging PID server (2007-2013), and the gradual emergence of new and better persistent identifiers.

The implementation of the ExLibris SFX link resolver in 2006 meant that the majority of e-journals could be linked through SFX with OpenURLs that pointed to the UC-wide SFX Knowledgebase instead of being redirected through the CDL PID server.[31] The SCP could rely on publishers to maintain metadata through ExLibris. With the implementation of the CONSER

PURL server in 2002,[32] the SCP was well poised to utilize CONSER PURLs (or BibPURLs) for linking open access resources when they became part of the SCP workflow in 2006. The ExLibris SFX link resolver and the CONSER PURL project expanded and distributed the responsibility of cooperative URL maintenance beyond the SCP level.

Around 2009, the launch of e-books (tens of thousands) necessitated not only new ways of providing access to these resources (batch processing) but also more efficient ways of maintaining the URLs. The number of e-resources in the CDL collection was growing as quickly as the CDL PID server was aging—it was clear that the PID server was becoming less capable of handling the growing data. Attempts to migrate the data and upgrade the software were unsuccessful but new and better types of persistent identifiers began emerging and proved to be more reliable and less prone to breakage: OpenURLs, DOIs, ARKS, permalinks, etc. While the CDL sought a replacement for the PID server, these new identifiers gave the SCP additional persistent linking options that supported and further expanded its original mission of providing URL persistence and cooperative URL maintenance. The original CDL PID server was redesigned and recreated in 2013 to continue maintenance of legacy data, support open access resources and licensed e-books, and serve as a last resort for persistence when no other options are available. The longevity of both the CDL PID server and the CONSER PURL server supports the potential and long-term sustainability of cooperative link maintenance. BibPURLs continue to be the best option for maintaining URL persistence for open access resources, since they are more susceptible to change than any other type of e-resource. For licensed resources, publishers have been making a more conscientious effort to provide persistent linking capabilities for their resources. Today, the SCP uses a variety of link resolution services and persistent identifiers to ensure URL persistence for their cataloged resources, compared to its initial exclusive reliance on the CDL PID server. Additionally, cooperative maintenance of URLs beyond the SCP level has led to less redundant, more cost-effective link resolution services, relieving one of the major burdens of consortial and e-resource cataloging.

Collaboration at UC and beyond

Conceived as a cooperative venture, the SCP strives to incorporate the cooperative model in all its activities to eliminate redundancies and improve efficiency, from cooperative URL maintenance, cooperative maintenance of shared metadata (OCLC records), cooperative cataloging, cooperative planning, to cooperative training. The SCP is constantly collaborating with other institutions, not only within UC but beyond.

One UC-wide collaborative project is the UC CONSER Funnel, which was established in 2006 to foster collaboration among e-journals catalogers at the UC campuses.[33] The initiative took advantage of existing UC CONSER participation and expertise to promote and provide a support network to encourage the maintenance and growth of the CONSER database through cooperative cataloging activities. The Funnel was so successful in its first two years that serial catalogers from the Getty Research Institute and California State Library joined the effort in 2008, expanding the benefits of the Funnel outside UC. Cooperative maintenance and cataloging by UC staff contribute to the international cataloging world (through the CONSER database) and, on a more local level, to the rest of UC through SCP record distribution. Today, catalogers from the various UC campuses and California institutions are still benefitting from the Funnel with e-journals training and guidance provided to new serials catalogers. These cooperative efforts contribute to and uphold the high quality expected of CONSER and SCP records.

Other cooperative and collaborative efforts include pilot cataloging projects between the SCP and institutions outside the UC. Since 2010, the SCP has participated in the CONSER Cooperative Open Access Journal Project (OAJ), a national cooperative cataloging project aimed at increasing the coverage of e-journal titles, especially open access titles, in the CONSER database.[34] In 2011, the SCP initiated a pilot project with the University of Maryland

to catalog the IEEE conference proceedings as an OCLC Worldcat Collection set. Still in effect today, the project was inaugurated in earnest in December 2011 with the sharing of procedures, search strategies, and macros. By January 2012, both parties conceived and agreed to a process to share the cataloging workload by dividing new titles into ongoing biweekly lists and provide each other with the OCLC numbers of cataloged records every month. This partnership continued despite the elimination of the OCLC WorldCat Collection sets and their efforts were not hindered by implementation of RDA. The strong collaboration and communication between the SCP and the University of Maryland allowed them to coordinate and work these changes into their existing procedures and macros without a compromise in quality or delay of cataloging. In 2013, the SCP partnered with the University of Oregon (and several other libraries) to provide high quality cataloging records through the OCLC WorldCat Collection sets for the National Academies Press (NAP) materials.[35] After the demise of the OCLC WorldCat Collection sets (2013), the SCP set up a global collection in the OCLC KB and still contributes new original records to the KB for the NAP resources on a weekly basis.

On the international level, the SCP is especially proactive and has partnered with many institutions on cataloging Chinese e-resources. The SCP and the University of Hong Kong are the only two institutions among CEAL member libraries that have staff resources dedicated to the cataloging of Chinese e-resources. They partnered with the goal of combining staff resources to do more with less by collectively identifying common issues (e.g., e-resource presentation and metadata issues that affect cataloging efficiency), collaboratively resolving problems, and organizing as a group to effectively communicate and cooperate with vendors and publishers to improve metadata practices. In 2014, the SCP staff led the CEAL ERMB Task Force in conducting a survey among CEAL libraries to identify the Chinese collections that would most benefit from a cooperative cataloging project, provided that three or more libraries expressed interest in the collaboration. Following the survey, the SCP staff, on behalf of the CEAL ERMB Task Force, launched and established cataloging projects for the following three

collections:[36]: 1) Dacheng old periodical full-text database (大成老旧刊全文数据库, 7,500 titles) (Cataloging partners: University of Hong Kong, Stanford University, and University of Washington); 2) Chinese periodical full-text database (1911-1949) (民国时期期刊全文数据库, 25,000 titles) (Cataloging partners: University of Michigan, Stanford University, and University of Washington); and, 3) China Academic Journals (CAJ, 中国期刊全文数据库, 12,000 titles) (Cataloging partners: Columbia University, University of Maryland, Claremont College, Yale University, Cornell University, University of Hong Kong). The initial cataloging for these projects was modeled after the well-known established cooperative cataloging model, the CONSER Cooperative Open Access Journal Project (OAJ). Record maintenance and updates for these collections are made via the OCLC WorldShare Collection Manager.

UC Model: Cost and Benefits

Two guiding principles of the SCP emphasize the ease of use for catalog users and expanding access to the maximum while minimizing cost. The idea of "one for ten" cataloging was conceived to reduce cataloging redundancies and save significant staff time and money ten times. Over the past six years, the CDL and UC Libraries conducted several studies substantiating the value of the SCP records and their impact on resource discovery and access by the ten campuses.

In FY 2010-2011, the CDL conducted an internal cataloging cost analysis study to compare the cataloging cost of the SCP cataloged e-books and campus cataloged print books from the same vendor. The cost of the SCP record ranged from 17 cents each for batch cataloging to $21.44 each for original full level cataloging. The average cost of the campus record ranged from $2.92 each for copy cataloging to $25 each for original full level cataloging. The calculations were based on staffing levels, cataloging time, and number of titles cataloged. Over the 28 month period of the study, the SCP cataloged over 25,668 titles at a total cost of

$78,523, an average of $3.06 per title, saving the campuses at least $223,005 during that period. Likewise, a study on the cost of the SCP record distribution revealed modest cost savings.

In May 2011, the UC Libraries Springer e-Book pilot project usage survey report corroborated that e-book users were most likely to discover e-books through 1) the library catalog, 2) a general Internet search engine, or 3) the library website. In figure 5 below, e-book discovery is broken down by Springer e-book users versus general academic e-book users. Based on 2,569 responses from all ten campuses, 60% of Springer e-book users and 53% of general (non-Springer) academic e-book users were most likely to discover and access e-books through library catalogs, rather than through assumed search engines such as Google which constitute 33% and 43% of users, respectively. See Figure 5 below which is Figure 23 in the report.[37]

Figure 5. UC 2011 Survey on Methods for discovering access to e-books, taken from Figure 23 of the Report

Discovering e-Books:
Springer e-Book Users Compared to General e-Book Users
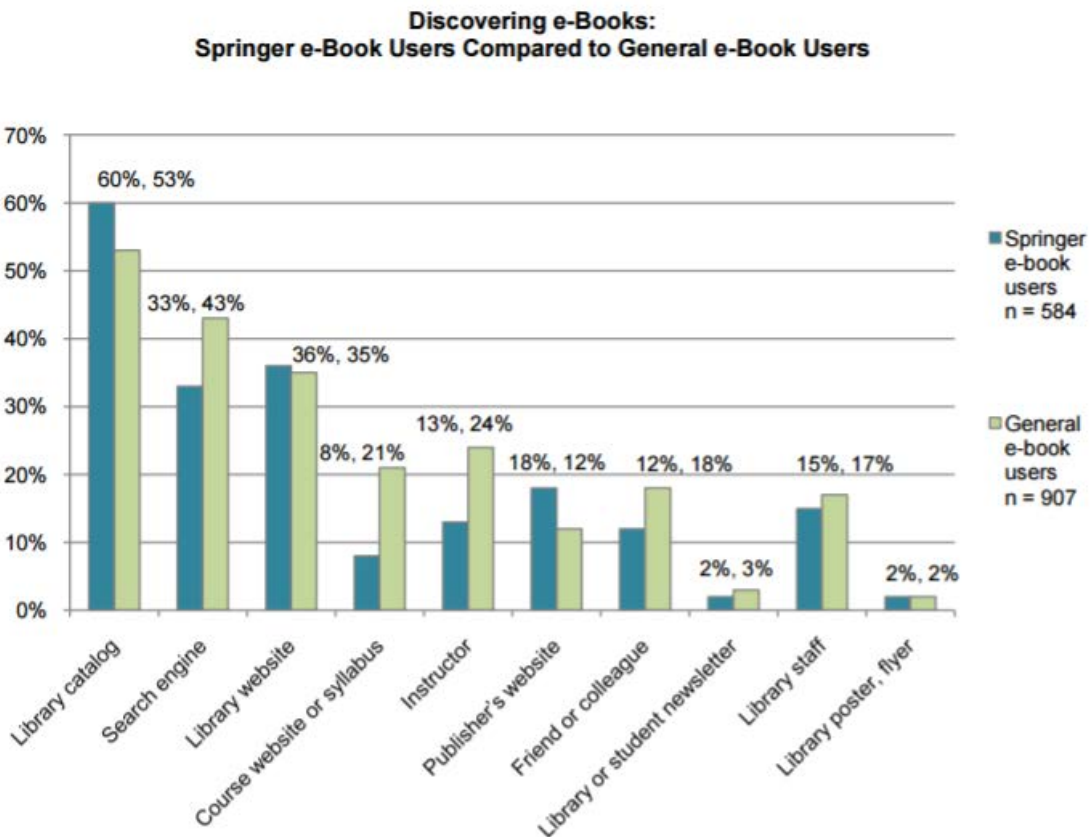
In fall 2015, the CDL and UC Santa Cruz jointly conducted a focus group to gather graduate students' responses to the question, "For your last scholarly book use, where did you get the book of your chosen format?" Seven out of thirty-one students (23%) indicated that they used e-books for their last book use. Four out of the seven students (57%) indicated that they found and accessed the e-books from their library online catalog.[38] Although this does not establish a direct correlation between SCP cataloging and e-book online discovery and retrieval, it does suggest that local library online catalogs are still heavily used and valued by students for digital resource discovery and retrieval which supports the import and relevance of SCP cataloging and record distribution. The import and relevance of SCP record distribution to the campuses for loading into local campus ILSs had previously been substantiated in the 2011 study carried out by POT5 and CAMCIG (see section on Record Distribution) so these responses were not surprising.

In 2010, the CDL witnessed a noticeable spike in usage data for CDL licensed e-books. Around this time, the SCP was fully engaged in batch processing techniques making thousands of e-books available to UC users in a short time. Figure 6 compares the monthly cataloging and usage data of two e-book packages in 2014-2016.[39] The usage data for package B (~488,000) is so high that the usage data for package A (~1,500) which is steady, lies on line zero. Figure 7 compares trends of cataloging and usage data of CDL licensed e-books in 2011-2016.[40] Overall, the data supports the implication that usage is driven by an increase in cataloging. Although more comprehensive research is needed to substantiate this observation, there is little doubt that the SCP cataloging plays a direct and valuable role in supporting increased discovery and access of CDL selected e-resources for the UC community.

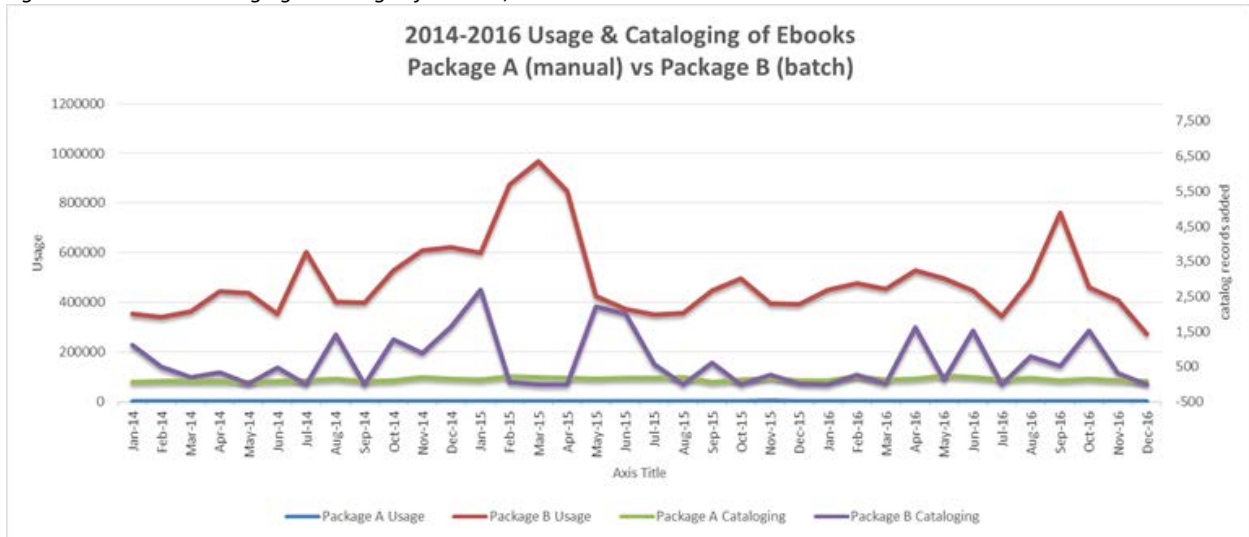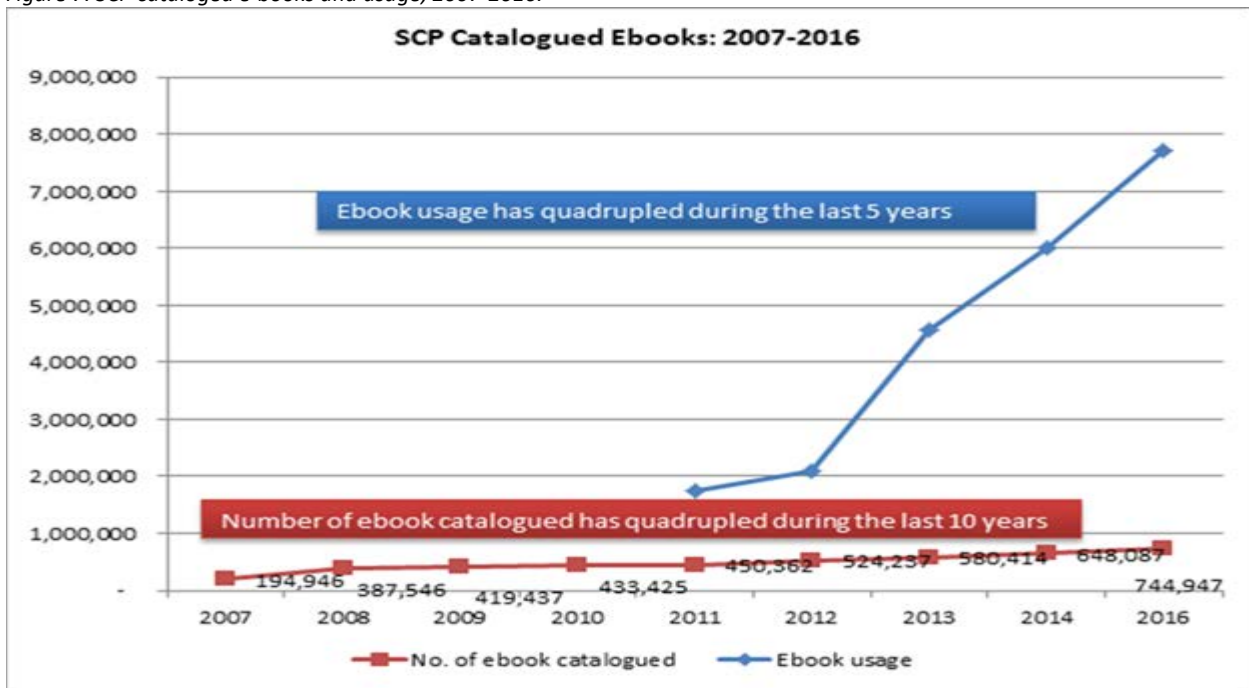*Figure 6. Trends in cataloging and usage of e-books, 2014-2016.*

Figure 7. SCP cataloged e-books and usage, 2007-2016.

UC Model: challenges and strategies

As stated by French, Culbertson, and Hsiung in 2002, "the success of a shared

cataloging program is measured by the extent to which it meets the needs of its participants."[41]

After seventeen years, the SCP has upheld its mission to provide the timely and economical

31

representation of CDL selected e-resources in Melvyl® according to national cataloging standards. Due to the SCP's cataloging efforts, the CDL collection usage quadrupled in the last five years, illustrating steady and increased support of UC faculty and students.

Going forward, the key to the SCP's continued sustainability will be the maintenance and cultivation of partnerships and collaborations with the UC campuses, other consortia and libraries, aggregators, publishers, and vendors. To succeed, good communication and persistence will be needed for all stakeholders to continue to develop innovative solutions and standards that all can follow. Additionally, close partnerships will be necessary for meeting local changes on the horizon, such as the implementation of a new ILS that will be shared by the SCP and its participants. The SCP will continue to be on the lookout for advances in technological systems and tools that are economically scalable and feasible and can be employed for the optimization of cost-efficient cataloging. The experience of the "One for Ten" Shared Cataloging Program demonstrates that a centralized cataloging model for e-resources can be sustainable and cost-effective in a complex library consortium environment.

Acknowledgements

32

Notes

[1] Celeste Feather, "The International Coalition of Library Consortia: origins, contributions and path forward," *Insights* 28, no. 3 (2015): 89-93, accessed March 10, 2016. doi.org/10.1629/uksg.260.

[2] Task Force on Electronic Resources, "Report to the University of California Heads of Technical Services." March 25, 1998. Available on the Internet Archive. Accessed August 8, 2017. https://web.archive.org/web/20070208163957/http://tpot.ucsd.edu/Cataloging/HotsElectronic/tfer.html

[3] University of California, California Digital Library. n.d. *Organization, Priorities, & Strategies.* Accessed April 10, 2017. http://www.cdlib.org/services/collections/scp/organization/.

[4] University of California, California Digital Library. n.d. *Collection Development and Management,* accessed April 10, 2017. http://www.cdlib.org/services/collections.

[5] Patricia Sheldahl French, Rebecca Culbertson, and Lai-Ying Hsiung, "One for nine: the shared cataloging program of the California Digital Library," *Serials Review* 28, no. 1 (2002): 4-12. doi: 10.1016/S0098-7913(01)00169-1

[6] Unique title refers a title cataloged using "a single provider-neutral record that incorporates all specific package and other local information on one record" according to the PCC Provider-Neutral E-Resource MARC Records Guide

[7] For the cost share model of funding the Chinese language cataloger position, UC San Francisco lacks an East Asian Studies program so they opted out.

[8] Task Force on Electronic Resources, "Report to the University of California Heads of Technical Services." March 25, 1998. Available on the Internet Archive. Accessed August 8, 2017. https://web.archive.org/web/20070208163957/http://tpot.ucsd.edu/Cataloging/HotsElectronic/tfer.html.

[9] Patricia Sheldahl French, Rebecca Culbertson, and Lai-Ying Hsiung, "One for nine: the shared cataloging program of the California Digital Library," *Serials Review* 28, no. 1 (2002): 4-12. doi:10.1016/S0098-7913(01)00169-1

[10] Julia Kochi, Armanda Barone, Adolfo R. Tarango, and Lucia Orlando, "POT 5 Report and Recommendations on Deliverable 1: Assess the benefits and risks of stopping the distribution of bibliographic records to the ten campuses for their local OPACs," September 20, 2012, accessed April 3, 2017. http://libraries.universityofcalifornia.edu/groups/files/ngts/docs/pots/pot5_deliverable_1.pdf

[11] Joint Steering Committee on Shared Collections, "SCP Cataloging Priorities," *CDL Shared Cataloging Program* website, October 11, 2016. Accessed April 13, 2017. http://www.cdlib.org/services/collections/scp/organization/Priorities.html

[12] CDL Shared Cataloging Program, "SCP Cataloging Priorities," *CDL Shared Cataloging Program* website, accessed September 8, 2017. http://www.cdlib.org/services/collections/scp/organization/Priorities.html

[13] CDL Shared Cataloging Program, "E-Resources Tracking: CDL Licensed Electronic Resources," *CDL Shared Cataloging Program* website, accessed April 13, 2017. http://www.cdlib.org/services/collections/scp/tracking/eresourcetracking.html

[14] Rebecca Culbertson, Annelise Sklar, and Donal O'Sullivan, "Bountiful Harvest: Batch Searching and Distribution of Electronic State Document MARC Records," *Dttp: Documents to the People* 2008: 9-11.

[15] Ibid.

[16] CDL Shared Cataloging Program, "Organization, Priorities, & Strategies," accessed April 19, 2017. http://www.cdlib.org/services/collections/scp/organization/

[17] Donal O'Sullivan, Rebecca Culbertson, and Adolfo Tarango, "Poster Sessions. Weapons of Mass Distribution: Cataloging with Deadly Efficiency," *Serials Librarian* 64(2013): 308. doi:10.1080/0361526X.2013.760300

[18] Patricia Sheldahl French, Rebecca Culbertson, and Lai-Ying Hsiung, "One for nine: the shared cataloging program of the California Digital Library," *Serials Review* 28, no. 1 (2002): 4-12. doi:10.1016/S0098-7913(01)00169-1

[19] Bie-hwa Ma, "Collaborative e-collection management: CEAL cooperative cataloging project for e-collections. CEAL Committee on Technical Processing," (conference presentation, Committee on Technical Processing, Council on East Asian Libraries annual conference, Toronto, Canada, March 14, 2017), accessed April 13, 2017. http://www.eastasianlib.org/ctp/Meetings/2017/Collaborative%20e-collection%20management_2017_03-14.pptx

[20] For a more in-depth discussion of Chinese vendor-supplied metadata and examples, see Connie Lam, "Chinese e-resource metadata problems that cause access issues," (conference presentation, Committee on Technical Processing, Council on East Asian Libraries annual conference, Philadelphia, PA, March 25, 2014), accessed March 16, 2016. http://www.eastasianlib.org/ctp/Workshops/2014/CEAL_ERMB_Connie_rev.pptx and Bie-hwa Ma, "Strengthening the Chinese electronic resources supply chain with standards and best practices," (conference presentation, Committee on Technical Processing, Council on East Asian Libraries annual conference, Toronto, Canada, March 14, 2012), accessed March 16, 2017. http://www.eastasianlib.org/ctp/Meetings/2012/Ma_StrengtheningChineseE.

[21] Bie-hwa Ma, Shi Deng, and Susan Xue, "Leveraging NISO standards and best practices to improve discovery and access of digital resources," International Journal of Librarianship 2017: 51-66.

[22] Patricia Sheldahl French, Rebecca Culbertson, and Lai-Ying Hsiung, "One for nine: the shared cataloging program of the California Digital Library," *Serials Review* 28, no. 1 (2002): 4-12. doi:10.1016/S0098-7913(01)00169-1

[23] Next-Generation Technical Services (NGTS), 2011-2013 was an initiative developed by the University Librarians and SOPAG to redesign technical services workflows across the full range of library formats in order to take advantage of new system-wide capabilities and tools, minimize redundant activities, improve efficiency, and foster innovation in collection development and management to the benefit of UC library users.

[24] Armanda Barone, Adolfo Tarango, Julia Kochi, and Lucia Orlando, "Evaluation of SCP Decision-Making Process for Cataloging Priorities, Final Report," September 20, 2012, accessed April 3, 2017. http://libraries.universityofcalifornia.edu/groups/files/ngts/docs/pots/pot5_scp_deliv3_final.pdf

[25] Valerie Bross, "The PCC/CONSER PURL Project: Improving Access to Free Resources," *Serials Librarian* 45, no. 1 (2003): 19-26. doi:10.1300/J123v45n01_02

[26] UC Link Resolver Planning Group, "UC Link Resolver General Principles & Detailed Linking Guidelines," *SCP Cataloging & Linking Guidelines* web page, October 3, 2005; accessed March 23, 2017. http://www.cdlib.org/services/collections/scp/docs/UClinkresolverguidelines.doc

[27] Shared Cataloging Program, "Linking Guidelines for CDL Licensed eJournals," *SCP Cataloging & Linking Guidelines* web page, April 10, 2009, accessed March 23, 2017. http://www.cdlib.org/services/collections/scp/docs/SFXlicensed.pdf

[28] Rebecca Culbertson, Annelise Sklar, and Donal O'Sullivan, "Bountiful Harvest: Batch Searching and Distribution of Electronic State Document MARC Records," Dttp: Documents to the People 36, no. 4 (Winter 2008): 9-11.

[29] Shared Cataloging Program, "Linking Guidelines for CDL Licensed eMonographs," *SCP Cataloging & Linking Guidelines* web page, Dec. 9, 2015, accessed, March 23, 2017.
http://www.cdlib.org/services/collections/scp/guidelines/856URLguidelinesforEmonographs.pdf

[30] California Digital Library, "Open Access Resources at the UC Libraries," *California Digital Library* website, June 9, 2006, accessed March 23, 2017. http://www.cdlib.org/services/collections/openaccess.html

[31] UC Link Resolver Planning Group, "UC Link Resolver General Principles & Detailed Linking Guidelines," *SCP Cataloging & Linking Guidelines* web page, October 3, 2005; accessed March 23, 2017.
http://www.cdlib.org/services/collections/scp/docs/UClinkresolverguidelines.doc

[32] Valerie Bross, "The PCC/CONSER PURL Project: Improving Access to Free Resources," *Serials Librarian* 45, no. 1 (2003): 19-26. doi:10.1300/J123v45n01_02

[33] Valerie Bross, "Doing More with More: The UC CONSER Funnel Experience," *Cataloging & Classification Quarterly*, Volume 48, no. 2-3 2010): 153-160. doi:10.1080/01639370903535676c

[34] Open Access Journal Project, "Cooperative Open Access Journal Project Report," *PCC CONSER website (Library of Congress),* April 30, 2010, accessed April 20, 2017 https://www.loc.gov/aba/pcc/conser/issues/Open-Access-Report.pdf

[35] Philip Young, Rebecca Culbertson & Kelley McGrath, "Collaborative batch creation for open access e-books: a case study," *Cataloging & Classification Quarterly*, 51, no. 1-3 (2012): 102-117. doi: 10.1080/01639374.2012.719075

[36] For more information about these projects, see Bie-hwa Ma, "Collaborative e-collection management: CEAL cooperative cataloging project for e-collections. CEAL Committee on Technical Processing," (conference presentation, Committee on Technical Processing, Council on East Asia Libraries annual conference, Toronto, Canada, March 14, 2017), accessed April 13, 2017.
http://www.eastasianlib.org/ctp/Meetings/2017/Collaborative%20e-collection%20management_2017_03-14.pptx

[37] Chan Li, Felicia Poe, Michele Potter, Brian Quigley, and Jacqueline Wilson. *UC Libraries Academic e-Book Usage Survey : Springer e-Book Pilot Project.* May 2011, accessed April 3, 2017.
http://www.cdlib.org/services/uxdesign/docs/2011/academic_ebook_usage_survey.pdf

[38] CDL and UC Santa Cruz focus group data was provided by Chan Li, CDL Sr. Data Analyst.

[39] Trends of usage data in the Figure 6 was provided by Nga Ong, CDL Library Data and Services Analyst.

[40] The usage data and the chart of the trends were provided and prepared by Chan Li, CDL Sr. Data Analyst.

[41] Patricia Sheldahl French, Rebecca Culbertson, and Lai-Ying Hsiung, "One for nine: the shared cataloging program of the California Digital Library," *Serials Review* 28, no. 1 (2002): 4-12. doi: 10.1016/S0098-7913(01)00169-1