Data Services at an Undergraduate-Research and Teaching-Centered University: Supporting Faculty and Students

Jeanine Marie Scaramozzino
Marisa L. Ramírez
Karen J. McGaughey
Cameron Anvari

California Polytechnic State University
San Luis Obispo, California 93405, United States of America

Abstract
California Polytechnic State University (Cal Poly) is one of the 23 campuses within the California State system. It is a four-year, public university, emphasizing comprehensive undergraduate education with a total enrollment of ~20,000 undergraduate and graduate students (96% undergraduate). Teaching and scholarship are both required by faculty but with limited research support services. A survey of faculty research data services needs was conducted in 2012. Survey invitations were emailed to a stratified random sample of 449 faculty (tenure-track or tenured assistant, associate and full professors only) and 226 responded for an overall response rate of 50%. The survey results provided a foundation from which services were created and have evolved over the last eight years in the Robert E. Kennedy Library and the university. This paper also shares the evolution and repurposing of research resources and services to support both faculty and students.

Keywords: Data curation in libraries, data services librarians, learning and scholarship, geographical information systems (GIS), education, library surveys, data literacy, researchers.

Introduction
Data comes in many forms from text to numbers to images to code and more. Data is the basis for all scholarly and professional communication. Data literacy, discovery, and reuse are growing in importance as these practices will support effective problem solving, innovation, collaboration and other activities across a wide array of disciplines and professions. With the deluge of data generated from contemporary research, scholars are now faced with greater challenges of storing, presenting, and managing datasets. This has become especially acute since most funding agencies now require data management plans, and funders and many publishers are requiring that the data underlying research findings to be accessible.

Support tools for data preservation, discovery, access, and education need to evolve along with the methods used in research and educational pedagogy. This requires a culture of flexibility, immediacy, and service through a mix of cross-institutional and cross-disciplinary structures that can take multiple forms. Needs can best be identified and matched with capabilities by fostering librarian-researcher partnerships and establishing programs for mutual engagement and education.
Librarians recognize the need to provide data services for their patrons. The challenge for libraries is to determine the data services that can assist faculty, but that are practical and sustainable to provide. Recognizing that the use of data is quickly evolving and data skills are becoming critical professional skills for college graduates, Cal Poly’s Library has evolved to support the data service needs of both students and faculty through the creation of new units, physical spaces, and services. Effective needs-based services require out of the box thinking, flexibility, and shifting the paradigm of the profession. It also requires building relationships outside the library with the office of research, office of grants development, office of graduate education, office of institutional assessment, etc. to coordinate efforts.

Background
Most faculty data service research conducted by libraries up to 2012 was focused on Ph.D. granting universities and research institutions. Tool creation, methods, and analysis lacked non-librarian participation, particularly by statisticians; the number of researchers interviewed and surveyed was small; and the process for developing survey tools was not clearly articulated. Work often focused on collection of individual researcher profiles or assessment of an organization’s researcher data management plans. In most cases libraries were developing data services without including other campus stakeholders. Services focused on creating institutional repositories, using big data, preparing data management plans, and supporting metadata requirements for discipline specific data repository deposit.

In contrast, this research was conducted at a primarily undergraduate institution, the survey tool was developed in concert with a faculty statistician over more than six months including pilot testing, and the number of responses was large for any organization. The survey included faculty from all disciplines represented on the campus, not just researchers in specific disciplines, researchers that utilize large amounts of data, or researchers that produce a lot of data. The 2012 survey results in conjunction with results from a complementary survey conducted in 2010 (Scaramozzino, Ramírez and McGaughey, 2012) were part of the foundation from which data services were created and the survey results continue to inform the evolution of services.

Survey Methods
The survey was conducted between April 30 and May 11, 2012 at Cal Poly. Following IRB approval, survey invitations were emailed to a stratified random sample of 449 faculty (assistant, associate and full professors only). The campus had a total of 631 full-time, assistant, associate and full professors, so the sample represents 71% of the population. Strata were defined using the college/unit in which faculty members are employed. In addition to the Library (LIB), Cal Poly is made up of six colleges: the College of Science and Mathematics (COSAM), the College of Liberal Arts (CLA), the College of Engineering (CENG), the College of Architecture and Environmental Design (CAED), the College of Agriculture, Food and Environmental Sciences (CAFES), and the Orfalea College of Business (OCOB). The random sample was chosen in proportion to the population within each of the colleges/units listed above. An e-mail invitation sent out on April 30, 2012 included a description of the survey/project goals, a link to the online survey in SurveyMonkey, and a gift card incentive for survey completion. An e-mail reminder was sent one week after the survey opened.

Of the 449 faculty to whom survey invitations were sent, 226 responded, for an overall response rate of 50%. Response rates and sample demographics by college/unit are shown in Table 1. Table 2 shows sample demographics by college/unit and academic rank.
Table 1: Response Rate by College/Unit

<table>
<thead>
<tr>
<th>College/Unit</th>
<th>Random Sample Invitations n</th>
<th>Number Responding n</th>
<th>Response Rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Agriculture, Food &amp; Environmental Sciences</td>
<td>63</td>
<td>31</td>
<td>49.2%</td>
</tr>
<tr>
<td>College of Architecture &amp; Environmental Design</td>
<td>46</td>
<td>15</td>
<td>32.6%</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>85</td>
<td>41</td>
<td>48.2%</td>
</tr>
<tr>
<td>College of Liberal Arts</td>
<td>108</td>
<td>54</td>
<td>50.0%</td>
</tr>
<tr>
<td>College of Science &amp; Mathematics</td>
<td>103</td>
<td>65</td>
<td>63.1%</td>
</tr>
<tr>
<td>Library</td>
<td>4</td>
<td>3</td>
<td>75.0%</td>
</tr>
<tr>
<td>Orfalea College of Business</td>
<td>40</td>
<td>17</td>
<td>42.5%</td>
</tr>
</tbody>
</table>

Table 2: Sample Demographics by College/Unit and Academic Rank

<table>
<thead>
<tr>
<th>College/Unit</th>
<th>Academic Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assistant Professor n (%)</td>
</tr>
<tr>
<td>College of Agriculture, Food &amp; Environmental Sciences</td>
<td>8 (25.8%)</td>
</tr>
<tr>
<td>College of Architecture &amp; Environmental Design</td>
<td>6 (40%)</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>7 (17.1%)</td>
</tr>
<tr>
<td>College of Liberal Arts</td>
<td>25 (46.3%)</td>
</tr>
<tr>
<td>College of Science &amp; Mathematics</td>
<td>25 (38.5%)</td>
</tr>
<tr>
<td>Library</td>
<td>1 (33.3%)</td>
</tr>
<tr>
<td>Orfalea College of Business</td>
<td>2 (11.8%)</td>
</tr>
</tbody>
</table>
The survey was composed of 16 questions which were developed to collect information on the data creation and use needs of Cal Poly faculty and disciplinary differences. See Appendix 1 to review the survey. Specifically, questions addressed the following hypotheses: (H1) Cal Poly faculty generate a variety of digital data in their research, scholarly, and professional creative activities; (H2) Cal Poly faculty frequently rely on storage methods outside of campus control for their digital data; (H3) Cal Poly faculty believe it is important to share their digital data with others; and (H4) Cal Poly faculty are interested in workshops, lectures and consultative services on data-related topics. There were three types of questions in the survey: (1) those with a dichotomous response (Yes/No), (2) those with a 5-point Likert response (Always, Frequently, Occasionally, Rarely, Never), (3) and those where participants were allowed to select all that applied.

The survey format, question wording, length of the survey, the use of an incentive, and the use of the online survey tool, SurveyMonkey, were all chosen with the aim to reduce the burden on respondents, increase the response rate and eliminate bias. The survey was pre-tested on a group of nine Cal Poly faculty who were not part of the random sample. Changes were made to the survey format and question wording to reflect concerns and eliminate points of confusion as indicated by the pre-testers.

While appropriate measures were taken to reduce any potential sources of bias, with an overall response rate of 50% there is the possibility of bias due to nonresponse. The individuals who did not respond to the survey might have answered differently than those who did respond. Additional sources of bias may have been introduced by allowing individuals to skip questions, scroll backwards and forwards, change their answers, and exit at any time.

Survey Results
The results are divided into five subsections addressing each of the five hypotheses of interest. For results based on the entire sample, the maximum margin of error is ± 5.2%.

Hypothesis 1
Hypothesis 1 assesses the variety and amount of digital data produced by Cal Poly faculty in their research, scholarly, and professional creative activities. Cal Poly faculty generate a variety of digital data in these activities. Faculty were asked to select all of the digital data types that they produce in their scholarly activity; choices included: digital images, audio/video files, textual data, spreadsheets, GIS data, CAD data, and other. Ninety-one percent of the respondents produce text files, 72% produce some sort of digital images, 65% produce spreadsheets, 36% of the sample produce digital audio/video, 15% produce CAD files, 11% produce GIS files, and 13% produce other types of digital files, such as computer software (mobile phone applications, video games), statistical data (Minitab, SAS, JMP files), and others. Table 3 contains all the digital data format(s) generated by faculty in their research, scholarly, and creative activities (RSCA).

Table 3: Digital data format(s) generated during faculty RSCA. The percentages listed are comprehensive and independent of college or unit.

<table>
<thead>
<tr>
<th>Digital Data Format</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textual documents (e.g. .txt, .doc, .docx, .rtf)</td>
<td>90.6 %</td>
</tr>
<tr>
<td>Digital images (e.g. .bmp, .jpg, .gif, .tiff, x-rays)</td>
<td>70.6 %</td>
</tr>
<tr>
<td>Spreadsheets (e.g. .xls, .sdq, .spv, .sav, .csv)</td>
<td>66.4 %</td>
</tr>
</tbody>
</table>
Data formats reported by college showed that a significant number of College of Science and Mathematics respondents indicated that most of their data is composed of digital images or other file types while the majority of the College of Liberal Arts respondents indicated having digital audio and video files. The College of Agricultural, Food and Environmental Sciences generated the most GIS data, the majority of the College of Architecture and Environmental Design and the College of Engineering faculty reported generating Computer Aided Design (CAD) Software files, and the Business college primarily created spreadsheets.

As noted above approximately 13% of digital data were identified as other, including: custom formats from digital chart-recorder software, images and data from instrument software, digital humanities webpages, multimedia learning objects, Mathematica notebooks, video games, programming languages/software code/computer programs, remote sensing data formats, musical scores, DNA sequencing files, and metadata. There is a need for support of file types that result from varied and numerous open source and proprietary software and hardware. Though certain repositories like GitHub are now regularly used for code and software, many types of data still have no clear repositories, no established disciplinary or worldwide metadata standards, no version control parameters, and no standard long-term storage options. This is particularly problematic when looking for long-term storage options for content created with newly developed tools and/or short-term grants or soft-money instead of the campus base budget.

The amount of digital data stored by the faculty person or their undergraduate and graduate student researchers and other research assistants is shown in Table 4. Approximately 73% of survey participants have less than 100 GB of stored data. Seven percent have two or more terabytes of stored data. When asked about future data storage capacity needs, 75% of responding faculty indicated that they would require less than 1 GB, up to 1 TB. About 18% indicated they would have large storage demands of 2 to 11 or more TB.

Table 4: Amount of current and future digital data generated during RSCA.

<table>
<thead>
<tr>
<th>Digital Data</th>
<th>Total Amount of Current Data % (n)</th>
<th>Total Amount of Future Data % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 GB</td>
<td>26.1% (59)</td>
<td>15.0% (34)</td>
</tr>
<tr>
<td>1 to 100 GB</td>
<td>146.5% (105)</td>
<td>33.2% (75)</td>
</tr>
<tr>
<td>101 GB to 1 TB</td>
<td>15.5% (35)</td>
<td>27.4% (62)</td>
</tr>
<tr>
<td>2 to 10 TB</td>
<td>4.9% (11)</td>
<td>12.8% (29)</td>
</tr>
<tr>
<td>11 or more TB</td>
<td>2.2% (5)</td>
<td>5.8% (13)</td>
</tr>
<tr>
<td>Other</td>
<td>4.9% (11)</td>
<td>5.8% (13)</td>
</tr>
</tbody>
</table>
Hypothesis 2
Hypothesis 2 assesses the digital data storage methods upon which Cal Poly faculty most frequently rely. Cal Poly faculty frequently rely on storage methods outside of campus control for their digital data. Respondents were asked to rate the frequency with which they use various storage media on a 5-point Likert scale (Always, Frequently, Occasionally, Rarely and Never). The storage methods and results can be seen in Table 5.

An overwhelming majority of 76% of surveyed faculty reported storing their digital data locally. More secure forms of storage, such as departmental and/or centrally provided servers were rarely if ever used. Only about 25% of those responding to the survey reported always or frequently using network-attached devices provided by their research group, department and/or college/university. Similarly, about 25% of respondents reported that they store their digital data in the cloud.

Table 5: Number and percentage of stated storage method(s) used currently by faculty.

<table>
<thead>
<tr>
<th>Storage Method</th>
<th>Always % (n)</th>
<th>Frequently % (n)</th>
<th>Occasionally % (n)</th>
<th>Rarely % (n)</th>
<th>Never % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local (CDs, DVDs, memory sticks, computer hard drive, local external hard drive)</td>
<td>76.0% (171)</td>
<td>20.4% (46)</td>
<td>2.7% (6)</td>
<td>0.4% (1)</td>
<td>0.4% (1)</td>
</tr>
<tr>
<td>Network-attached device managed by research group</td>
<td>11.4% (23)</td>
<td>13.4% (27)</td>
<td>12.4% (25)</td>
<td>14.9% (30)</td>
<td>48.0% (97)</td>
</tr>
<tr>
<td>Departmental server</td>
<td>8.4% (17)</td>
<td>13.4% (27)</td>
<td>14.9% (30)</td>
<td>13.9% (28)</td>
<td>49.5% (100)</td>
</tr>
<tr>
<td>Centrally-provided storage (e.g., a Cal Poly server provided by college or IT support services)</td>
<td>10.8% (22)</td>
<td>15.8% (32)</td>
<td>12.8% (26)</td>
<td>12.3% (25)</td>
<td>48.3% (98)</td>
</tr>
<tr>
<td>In the cloud (e.g. Amazon S3, disciplinary repository)</td>
<td>11.0% (22)</td>
<td>13.4% (27)</td>
<td>11.4% (23)</td>
<td>10.0% (20)</td>
<td>54.2% (109)</td>
</tr>
</tbody>
</table>

Anticipating that faculty tend to use the storage methods that are the most convenient, respondents were asked to identify all of the storage methods they would consider using if they were readily available. While 85% reported some continued use of local storage formats, over 50% of respondents reported they would consider using network-based resources. When asked how often they would use each of the storage formats if they were readily available, close to 50% of faculty responded they would always or frequently use network-attached devices managed by their research group or departmental servers; over 50% responded that they would use centrally-provided servers or the cloud. Results can be seen in Table 6.
Table 6: Number and percentage of stated storage method(s) considered by faculty.

<table>
<thead>
<tr>
<th>Storage Method</th>
<th>Always % (n)</th>
<th>Frequently % (n)</th>
<th>Occasionally % (n)</th>
<th>Rarely % (n)</th>
<th>Never % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local (CDs, DVDs, memory sticks, computer hard drive, local external hard drive)</td>
<td>67.0% (144)</td>
<td>23.3% (50)</td>
<td>5.6% (12)</td>
<td>2.3% (5)</td>
<td>1.9% (4)</td>
</tr>
<tr>
<td>Network-attached device managed by research group</td>
<td>17.9% (32)</td>
<td>28.5% (51)</td>
<td>24.0% (43)</td>
<td>14.0% (25)</td>
<td>15.6% (28)</td>
</tr>
<tr>
<td>Departmental server</td>
<td>14.3% (26)</td>
<td>31.3% (57)</td>
<td>26.4% (48)</td>
<td>11.0% (20)</td>
<td>17.0% (31)</td>
</tr>
<tr>
<td>=Centrally-provided storage (e.g., a Cal Poly server provided by college or IT support services)</td>
<td>20.2% (40)</td>
<td>37.4% (74)</td>
<td>20.2% (40)</td>
<td>8.6% (17)</td>
<td>13.6% (27)</td>
</tr>
<tr>
<td>In the cloud (e.g., Amazon S3, disciplinary repository)</td>
<td>26.8% (51)</td>
<td>25.3% (48)</td>
<td>15.3% (29)</td>
<td>10.5% (20)</td>
<td>22.1% (42)</td>
</tr>
<tr>
<td>Local (CDs, DVDs, memory sticks, computer hard drive, local external hard drive)</td>
<td>67.0% (144)</td>
<td>23.3% (50)</td>
<td>5.6% (12)</td>
<td>2.3% (5)</td>
<td>1.9% (4)</td>
</tr>
</tbody>
</table>

Over 90% of faculty in all colleges report using local storage devices always or frequently. For the other storage methods, over 50% of engineering faculty report always or frequently using network-attached devices managed by a research group or departmental servers. Fifty percent of business faculty, 43% of architecture faculty and 67% of library faculty report always or frequently using cloud-based storage methods. Results can be seen in Table 7.

Table 7: Number and percentage of faculty responding they “Always” or “Frequently” use the stated storage method, tabulated by college/unit.

<table>
<thead>
<tr>
<th>Storage Method</th>
<th>CAFES % (n)</th>
<th>CAED % (n)</th>
<th>CENG % (n)</th>
<th>CLA % (n)</th>
<th>COSAM % (n)</th>
<th>LIB % (n)</th>
<th>OCOB % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local (CDs, DVDs, memory sticks, computer hard drive, local external hard drive)</td>
<td>96.8% (30)</td>
<td>93.3% (14)</td>
<td>92.7% (38)</td>
<td>100% (54)</td>
<td>98.4% (63)</td>
<td>33.3% (1)</td>
<td>100% (17)</td>
</tr>
<tr>
<td>Network-attached device managed by research group</td>
<td>0% (0)</td>
<td>30.8% (4)</td>
<td>51.3% (19)</td>
<td>21.7% (10)</td>
<td>22.6% (14)</td>
<td>0% (0)</td>
<td>21.4% (3)</td>
</tr>
</tbody>
</table>
Hypothesis 3
Hypothesis 3 assesses the attitudes of Cal Poly faculty regarding sharing of digital data. Thirty-two percent of responding faculty believed it is important to make their digital data freely available to colleagues. Twenty-two percent said it is not important, and 46% believed it depends on the type of data (e.g. whether or not the data is proprietary). For attitudes regarding sharing of data with the general public, only 18% believed it is important, while 36% said they do not believe their data should be made freely available, and 45% believed it again depends on the type of data (e.g. whether or not the data is proprietary). Some faculty provided comments which gave context for their answers. Comments fell into a number of general categories including differences regarding in-progress/unpublished data and data used in publications, issues associated with confidentiality and non-disclosure agreements, whether the data was collected by an individual researcher or their lab or as part of a larger research program collective, lack of clarification of data ownership, ignorance of data repository options, and metadata requirements necessary for sharing data. These comments were mirrored in faculty interest in educational opportunities.

Hypothesis 4
The survey questions that addressed hypothesis 4 focused on Cal Poly faculty interest in workshops, lectures and consultative services on data-related topics. Respondents were asked to indicate their interest in various lectures, seminars, trainings and workshops and were given the option to check all that applied. The choices provided were varied with some that were software specific and others that were topical. Please see Table 8 for the list of topics and the percentage of faculty indicating interest. Note that there were options for instruction in everything from statistical and spatial software to digital humanities and visualization. Results indicated that GIS and other spatial literacy programming were of the most interest. Faculty, primarily those that produced digital image data, were interested in ways to visually communicate the results of their research. These results are still relevant today as the majority of faculty and student support requests surround research and instructional support in spatial reasoning, quantitative literacy, and visualization.
Table 8: Topics and percentage of faculty interest(s) in educational opportunities.

<table>
<thead>
<tr>
<th>Topics</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Google Earth for Educators</td>
<td>27.8 % 63</td>
</tr>
<tr>
<td>SPSS (statistical software)</td>
<td>26.0 % 59</td>
</tr>
<tr>
<td>SAS (statistical software)</td>
<td>22.9 % 52</td>
</tr>
<tr>
<td>Introduction to Data Mining</td>
<td>22.5 % 51</td>
</tr>
<tr>
<td>Opportunities to Use Geographic Information Systems (GIS) in Research</td>
<td>20.7 % 47</td>
</tr>
<tr>
<td>None of the Above</td>
<td>19.8 % 45</td>
</tr>
<tr>
<td>R (statistical software)</td>
<td>19.4 % 44</td>
</tr>
<tr>
<td>2010 Census / American Community Data Workshop</td>
<td>17.2 % 39</td>
</tr>
<tr>
<td>Locating and Using Social Science Data</td>
<td>15.4 % 35</td>
</tr>
<tr>
<td>Getting Started with ESRI ArcGIS</td>
<td>14.5 % 33</td>
</tr>
<tr>
<td>Using Smart Phones for GIS Field Work</td>
<td>14.5 % 33</td>
</tr>
<tr>
<td>Introduction to Google Map Maker</td>
<td>14.1 % 32</td>
</tr>
<tr>
<td>JMP Statistical Discovery Software (data visualization and analytics)</td>
<td>12.8 % 29</td>
</tr>
<tr>
<td>Digital Humanities</td>
<td>11.0 % 25</td>
</tr>
<tr>
<td>Web Privacy</td>
<td>10.6 % 24</td>
</tr>
<tr>
<td>Advanced ESRI ArcGIS (e.g. ArcGIS and 3D Visualization, Raster Data, Topology)</td>
<td>9.7 % 22</td>
</tr>
<tr>
<td>Integrating Technology into Humanities Research</td>
<td>9.7 % 22</td>
</tr>
<tr>
<td>Visualizing Social Connections (commercial implications, political implications, etc.)</td>
<td>9.7 % 22</td>
</tr>
<tr>
<td>ESRI Geodatabases (spatial data repositories)</td>
<td>9.3 % 21</td>
</tr>
<tr>
<td>Other (please specify other possible topics for lectures, seminars, trainings or workshops of interest):</td>
<td>8.4 % 19</td>
</tr>
<tr>
<td>Literary Analysis and Digital Technology</td>
<td>7.9 % 18</td>
</tr>
<tr>
<td>Locating, Utilizing, and Creating Digitized Historical Maps</td>
<td>7.9 % 18</td>
</tr>
<tr>
<td>Integrating Technology into Humanities Research</td>
<td>7.5 % 17</td>
</tr>
<tr>
<td>Big Data in Business</td>
<td>7.1 % 16</td>
</tr>
<tr>
<td>Introduction to OpenStreetMap</td>
<td>5.3 % 12</td>
</tr>
<tr>
<td>Music Visualization</td>
<td>5.3 % 12</td>
</tr>
<tr>
<td>ESRI Business Analyst</td>
<td>4.4 % 10</td>
</tr>
<tr>
<td>ESRI Community Analyst</td>
<td>4.4 % 10</td>
</tr>
<tr>
<td>Managing Lidar Data</td>
<td>4.4 % 10</td>
</tr>
<tr>
<td>Introduction to Scribble Maps</td>
<td>4.0 % 9</td>
</tr>
</tbody>
</table>
Respondents were also asked to indicate their interest in various consultative services and were given the option to check all that applied. Please see Table 9 for the list of topics and the percentage of faculty indicating interest. Across all college faculty, learning about the best practices for storing and preserving digital data was of the most interest at over 50%, as well as support to visually communicate their research data at 41% (e.g. use of graphs, charts, infographics), 38% were interested in better understanding data intellectual property, copyright and attribution, and 38% were interested in methods for identifying new colleagues with complementary research interests.

**Table 9: Topics and percentage of faculty interest(s) in consultative services.**

<table>
<thead>
<tr>
<th>Topics</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ways to Communicate Visually the Results of My Research (e.g. use of graphs, charts, infographics)</td>
<td>41.0 % 93</td>
</tr>
<tr>
<td>Information on How to Develop a Data Management Plan Required by Funding Agencies</td>
<td>24.7 % 56</td>
</tr>
<tr>
<td>Methods for Sharing Digital Data with Everyone via the Internet</td>
<td>22.0 % 50</td>
</tr>
<tr>
<td>Best Practices for Storing and Preserving Digital Data</td>
<td>51.5 % 117</td>
</tr>
<tr>
<td>Information on Ownership, Attribution and Copyright of Digital Data</td>
<td>38.3 % 87</td>
</tr>
<tr>
<td>Ways to Discover and Access Other Researchers’ Digital Data</td>
<td>25.6 % 58</td>
</tr>
<tr>
<td>Methods for Identifying New Colleagues with Complementary Research Interests</td>
<td>31.3 % 71</td>
</tr>
<tr>
<td>None of the Above</td>
<td>21.2 % 48</td>
</tr>
<tr>
<td>Other (please specify other consultative services of interest):</td>
<td>1.8 % 4</td>
</tr>
</tbody>
</table>

**Discussion**

The creation of a data services program moved quickly after the Library’s first survey in 2010, “A Study of Faculty Data Curation Behaviors and Attitudes at a Teaching-Centered University” (Scaramozzino, Ramirez and McLaughhey, 2012). This survey garnered 82 responses from 131 survey invitations for a 63% response rate, and survey questions were directly mapped to attitudes and actual behaviors of faculty. Results of this initial survey clearly indicated that the Library was not seen as a resource for any data related needs. After the 2010 survey was deployed faculty began to see the Library as a resource for data services, and as it started offering services, word spread through the campus community. The campus is unusual in that a research senior project or practical culminating experience is required for undergraduate graduation. While supporting data service needs of faculty it became apparent that students had many similar needs but also had some unique needs. As a result, the Library started exploring different services options and testing them out, and used information gleaned from the increasing volume of data reference questions and the 2012 data services needs survey to optimize resources. Figure 1a and 1b show major events regarding the evolution of Library’s data needs support system from 2010 to 2017.

The Library was nimble and learned to accommodate the real needs that were expressed by campus patrons and campus partners. The Library intentionally did not reinvent the wheel, and
instead focused on partnering with colleagues from other universities to examine their campus data curation needs, reuse their tools and educational materials, and share experiences. An informal monthly online meeting was instituted with staff and faculty at four other institutions that were also developing or expanding their data services. These discussions resulted in a paper: “Map Room to Data and GIS Services: Five University Libraries Evolving to Meet Campus Needs and Changing Technologies” (Scaramozzino et al., 2014). This working group provided a two-way teaching-learning environment regarding all aspects of data services. A specific example of something learned was how Data Services adjusted the interviewing process for GIS student assistants to truly assess their knowledge of tools and concepts. Prospective hires were required, without previous warning, to demonstrate their skills by completing GIS software tasks and answering reference questions as part of the interview.

Figure 1a: Data Service Program Development Timeline - 2010-2012

A number of ancillary benefits were derived from the distribution of the surveys. Informal word of mouth generated interest among faculty who wanted to learn more about data. Consequently, the library was asked to give presentations to faculty and graduate students about library services, resources, and infrastructure to support research and grant writing. Departmental faculty began to contact their subject librarians for help with data management plans, requesting lists of discipline-specific repositories, information on how to deposit data in the library’s institutional repository, and grant writing assistance. Additional attention was generated from a broad cross-section of groups across campus. For example, the campus Grants Development Office regularly handles numerous Department of Defense and Office of Naval Research grants, and they asked the library to coordinate workshops on data management plans in order to support their office, the Center for Teaching and Learning and the Office of Research and Graduate Programs.

In Spring 2011 the Data Services unit was officially created with a team that included half of a librarian and 2-3 GIS student assistants. The Data Services librarian was able to secure a physical space for 1-2 Statistics Department student tutors, financially support by the College of
Science and Math, in order to support all students. The unit focused on supporting students and faculty in finding and using data for classwork, scholarship, teaching, and learning. After the Spring 2012 survey the challenge for the library was to determine the data curation services that could assist faculty the most while also creating opportunities to promote library strengths and expertise. During that same quarter, a donor supported the renovation of library space into the Data Studio. This renovation included the provision of specialized hardware and software in order to provide a flexible space for computing, data display and visualization, group work, peer instruction, and presentations. In Summer of 2012 a temporary half-time Data and GIS Specialist was hired and the position was upgraded to a permanent full-time hire in Fall 2012.

Figure 1b: Data Service Program Development Timeline - 2012-2017

Of all library consultations - 10% are GIS or data related

Increased & varied educational workshops & course instruction

Academic & Scholarly Communications Services Unit Created

2012-2013

2012-2016

2012

2017

Ongoing

Outreach - Data Studio Presents Speaker Series

DS Unit becomes part of Ref (Data Studio to Digital Research, Scholarship & Creative Activities Hub to Digital Projects Lab)

Figure 1b shows the continued evolution of the program and major milestones. GIS and data-related questions constituted approximately 10% of the ~4,000 general reference questions recorded by all Library staff in the academic year 2012-2013. General data reference questions come in several forms, ranging from simple directional guidance in locating known data sets to more complex questions involving research methodology. There was clear evidence of a need to provide outreach and instruction, all of which was financially supported by the Library administration and other campus stakeholders. With GIS activities distributed across several departments and colleges on campus and without any other center for geographic research, the Data Studio served as a hub for coordinating common GIS data sets, communications, training, and other resources.

Outreach and education increased and diversified. Data curation research guides were the modest first step which included information on basics of data management, educational resources, backup practices, ethical/legal and copyright issues, funder requirements, grant writing best practices, creation of data management plans, links to data repositories and databases, and links to other data management resources. The research guides were promoted during presentations to new faculty and graduate students and used in relevant seminars organized by Cal Poly’s Office of Research and Graduate Programs. Feedback was positive, and the online usage statistics indicated growing interest in the resources. Over time these
initial research guides developed into a significant number of diverse, in-depth, and information-rich guides.

Key outreach programs were developed and supported by Data Services throughout the year in order to promote engagement of data and GIS users from across campus. These included The Data Studio Presents speaker series, GIS Day, Geography Awareness Week, and the Annual Data Studio Open House. The Data Studio Presents speaker series provided educational outreach for a range of data-and GIS-related topics, offering an accessible and informal setting for students and faculty interested in working with data in new ways. The speaker series was hosted within the Data Studio with an audience of approximately thirty attendees per event and intended for brief intermittent discussion on a variety of topics in the rapidly advancing data and GIS fields. In four years, almost 30 presentations, workshops, and events were held including an overview of military and historic applications of GIS, OpenStreetMap resources, new GIS tools on the Web from ESRI and Google, open data and repositories resources, data management planning tools, cybersecurity, STEAM events with scientist/artists co-hosted with a local museum and more. These initial programs and their assessment followed similar best practices developed in the Science Café Speaker Series (Scaramozzino and Trujillo, 2010). See Appendix 2 for a listing of events with descriptions, number of attendees, cursory impact data and more.

In 2017 Data Services was ingested into the Reference unit and the Data Studio physical space became the Digital Research, Scholarship and Creative Activities Hub and later the Digital Projects Lab. The Reference coordinator oversees 1 staff member and a number of GIS, programming, and statistics student assistants. The staff of the Digital Projects Lab focuses on support of faculty course instruction and consultation on research projects. These individuals collaborate with the First Year Experience Librarian around metaliteracy.

A separate Academic and Scholarly Communication Services unit was formed in 2017, consisting of one-third of a librarian, a specialist in research, scholarship and publishing, and student assistants; this unit focuses on advancing the collection, discovery, accessibility, preservation, and impact of research and scholarship by Cal Poly students, staff, and faculty. Academic and Scholarly Communications Services focuses on outreach to and collaboration with external campus stakeholders, education and training surrounding a variety of researcher tools, researcher reputation management, scholarly publishing, technological infrastructure including the management of the institutional repository, assessment of research impact, and collection development of content created and related to Cal Poly undergraduate, graduate, and faculty research.

Conclusion
Other university libraries continue to use modified versions of the 2010 survey at their campuses and the 2012 survey can easily be adapted for reuse. The survey tool is valuable for identifying trends and how individual disciplines and researchers differ regarding data service needs. The results provided Cal Poly information to move forward, to explore options, and to adapt to significant changes in human resources, and library and campus data service priorities.

As data services evolve it is critical that the Library continue to: prioritize sustainability and flexibility; nurture a culture that is always prepared for unexpected and sudden changes; identify what researchers want and need; and determine what resources are available. No library has all the resources it needs but all libraries can connect people to the information they need, whether directly to the information or to a path to the information.
As the world of information sciences and data curation moves forward into uncharted waters libraries will have to find ways to be more sustainable and flexible. As unforeseen and unexpected changes arise, partnerships and collaborations will allow libraries to continue to participate in and influence transformations in data creation, data sharing workflows, data visualization, scholarly communication models, and technical infrastructure. Hopefully the future will bring a reciprocal flow of influence: librarians influencing the data practices of researchers and researchers and their data practices influencing the services provided by libraries.

References


Acknowledgements
This work was financially supported by California Polytechnic State University’s Robert E. Kennedy Library. We would like to thank the Library Administration and staff for its support of the Data Services unit. We also thank the University Librarian’s Administrative staff, Facilities and Information Technology Services staff and students, and Communications and Public Programs staff and students for pre, post and day of presentation support. We would like to thank the Cal Poly teaching faculty for their invaluable support and contributions to this research. We would specifically like to thank Russ White (Data and GIS Specialist), Brett Bodemer (Reference and Digital Projects Lab Coordinator), and Danielle Daughtery (Research, Scholarship and Publishing Specialist) who continue to develop and reimagine the scope of data services at the library. Our work could not have been completed without the incredible work and support from numerous Library student assistants and Department of Statistics undergraduate students. We would like to thank Khue Duong (CSULB Science Librarian), Dr. Jason Blank (Cal Poly Department of Biology), and Library student assistants Duncan Davis-Hall and Diana Hernandez for their constructive feedback on the manuscript. In the past eight years so many individuals have contributed to the Library’s work in this area and we are sorry we cannot list them all.
Appendix 1
Survey of Faculty Research Data Services Needs

A research project on data service needs of the Cal Poly faculty is being conducted by Robert E. Kennedy Librarians Jeanine Scaramuzzino and Marisa Ramirez and Karen McGaughey of the Statistics Department.

A number of other universities have successful data service programs including Stanford University’s Social Science Data and Software Services, New York University’s Data Service Studio and UCLA’s Center for Digital Humanities.

This online survey contains sixteen questions and may take up to ten minutes to complete. If you choose, at the end of the survey you may submit your email address and name to be entered into a drawing for an El Corral gift certificate. The first 50 respondents will be entered into a drawing for one of two $25 El Corral gift certificates. All respondents will be entered into a drawing for one of twenty $10 El Corral gift certificates.

Please read the informed consent information below. If you agree to participate voluntarily in this research project as described, please indicate your agreement by clicking “Yes, I volunteer” below and completing the online survey.

You are being asked to take part in this study by completing the following questionnaire. Please be aware that you are not required to participate in this research and you may discontinue your participation at any time without penalty. You may also choose to omit questions that you would prefer not to answer. The risks associated with participation in this study are no more than the participant would encounter in everyday life. Your responses will be confidential. The results of the survey will be aggregated and shared as a whole. After the drawing has been completed all identifiers will be deleted. Potential benefits associated with the study include a deeper understanding of faculty interest in data services.

If you have questions regarding this study or would like to be informed of the results when the study is completed, please feel free to contact: Jeanine Scaramuzzino, College of Science and Math, School of Education, and Data Services Librarian (jscaramo@calpoly.edu), Marisa Ramirez, Digital Repository Librarian (mramir14@calpoly.edu) or Karen McGaughey, Assistant Professor of Statistics (kmcgaugh@calpoly.edu). If you have concerns regarding the manner in which the study is conducted, you may contact Dr. Steve Davis, Chair of the Cal Poly Human Subjects Committee (sdavis@calpoly.edu) or Dr. Susan Opava, Cal Poly Dean of Research and Graduate Programs (sopava@calpoly.edu). Please print out this consent form for your reference.

Thank you for your participation in this research!

1. Do you volunteer to participate in this survey?
   - [ ] Yes, I volunteer.
   - [ ] No thank you.
Digital Data

Data includes any recorded information or statistics that can be brought together for reference or analysis. The term “digital data” used in this survey refers to any data, either used in or produced by research, scholarship or professional creative activities that can be stored in digital form. These include: text, numbers, images, video or movies, audio, software, algorithms, equations, animations, models, simulations and so forth. Such data may be generated by various means including observation, computation, experimentation and derivation.

2. Do you produce digital data from your research, scholarly and professional creative activities? (please select one response)
   ○ Yes
   ○ No

Digital Data Formats

3. What digital data format(s) do you generate in your research, scholarly and professional creative activities? (please select all that apply)
   ○ Digital images (e.g. .bmp, .jpg, .gif, .tiff, x-rays)
   ○ Digital audio or video files (e.g. .mp3, .aiff, .wav, .avi, .mov, .mxf)
   ○ Textual documents (e.g. .txt, .doc, .docx, .rtf)
   ○ Spreadsheets (e.g. .xls, .sdq, .spx, .sav, .csv)
   ○ Geographic Information Systems (GIS) files (e.g. .gpix, .kmz)
   ○ Computer-Aided Design (CAD) files (e.g. .dwg, .dxf, .plt)
   ○ Other (please specify):

Storage Options

The answers to the following five questions may help to inform campus decisions regarding the storage of digital data.

4. Please estimate the TOTAL amount of CURRENT digital data stored by you, your undergraduates, graduates and research assistants as a result of your research, scholarly and professional creative activities. (please select one response)
   ○ ≤1 Gigabyte (GB)
   ○ >1 GB and ≤100 Gigabytes
   ○ 101 Gigabytes to 1 Terabyte (TB)
   ○ 2 Terabytes to 10 Terabytes
   ○ >11 Terabytes
   ○ Other (please specify):
5. Please estimate the TOTAL amount of digital data storage you, your undergraduates, graduates and research assistants might need in the FUTURE as a result of your research, scholarly and professional creative activities. (please select one response)

   - ≤1 Gigabyte (GB)
   - >1 GB and ≤100 Gigabytes
   - 101 Gigabytes to 1 Terabyte (TB)
   - 2 Terabytes to 10 Terabytes
   - >11 Terabytes
   - Other (please specify):


6. Please estimate the TOTAL amount of digital data storage you, your undergraduates, graduates and research assistants might need in the FUTURE as a result of your research, scholarly and professional creative activities. (please select one response)

   - ≤1 Gigabyte (GB)
   - >1 GB and ≤100 Gigabytes
   - 101 Gigabytes to 1 Terabyte (TB)
   - 2 Terabytes to 10 Terabytes
   - >11 Terabytes
   - Other (please specify):
7. Please indicate the frequency with which you use each format listed below to store digital data generated by your research, scholarly and professional creative activities.

<table>
<thead>
<tr>
<th>Format</th>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local storage formats (e.g. CDs, DVDs, memory sticks, computer hard drive, local external hard drive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network-attached storage device managed by my research group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Departmental server</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrally-provided storage (i.e. on a Cal Poly server provided by my college or IT support services)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the cloud (e.g. Amazon S3, disciplinary repository)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other (please specify):

8. If all of the methods listed below were readily available for storage of digital data generated by your research, scholarly and professional creative activities, which of the following would you consider using? (please select all that apply)

- [ ] Local storage formats (e.g. CDs, DVDs, memory sticks, computer hard drive, local external hard drive)
- [ ] Network-attached storage device managed by my research group
- [ ] Departmental server
- [ ] Centrally-provided storage (i.e. on a Cal Poly server provided by your college or IT support services)
- [ ] In the cloud (e.g. Amazon S3, disciplinary repository)
- [ ] Other (please specify):
9. If all of the methods listed below were readily available for storage of digital data generated by your research, scholarly and professional creative activities, please indicate the frequency with which you would use each method.

<table>
<thead>
<tr>
<th>Method</th>
<th>Always</th>
<th>Frequently</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local storage formats (e.g., CDs, DVDs, memory sticks, computer hard drive, local external hard drive)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network-attached storage device managed by my research group</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Departmental server</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrally-provided storage (i.e. on a Cal Poly server provided by my college or IT support services)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the cloud (e.g. Amazon S3, disciplinary repository)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other (please specify):

Information Sharing

10. Do you think that it is important to make your digital data freely available to your colleagues?

- [ ] Yes
- [ ] No
- [ ] It depends

Please explain your answer:

11. Do you think that it is important to make your digital data freely available to the general public?

- [ ] Yes
- [ ] No
- [ ] It depends

Please explain your answer:
Educational and Consultative Services

The Kennedy Library is currently developing a suite of educational and consultative services surrounding data in the form of workshops, seminars, trainings, online informational guides, in-person consultations and online tools. The Kennedy Library would like to gauge your interest in the following topics and services.

12. Please indicate your interest in the following topics for lectures, seminars, trainings or workshops for faculty (please check all that apply):

- 2010 Census / American Community Data Workshop
- Opportunities to Use Geographic Information Systems (GIS) in Research
- Getting Started with ESRI ArcGIS
- Advanced ESRI ArcGIS (e.g. ArcGIS and 3D Visualization, Raster Data, Topology)
- ESRI Geodatabases (spatial data repositories)
- ESRI Business Analyst
- ESRI Community Analyst
- Google Earth for Educators
- Managing Lidar Data
- Using Smart Phones for GIS Field Work
- Introduction to OpenStreetMap
- Introduction to Scribble Maps
- Introduction to Google Map Maker
- Integrating Technology into Humanities Research
- Digital Humanities
- Locating and Using Social Science Data
- Integrating Technology into Humanities Research
- Web Privacy
- Music Visualization
- Literary Analysis and Digital Technology
- Visualizing Social Connections (commercial implications, political implications, etc.)
- Locating, Utilizing, and Creating Digitized Historical Maps
- Big Data in Business
- Introduction to Data Mining
- JMP Statistical Discovery Software (data visualization and analytics)
- SAS (statistical software)
- SPSS (statistical software)
- R (statistical software)
- None of the Above
- Other (please specify other possible topics for lectures, seminars, trainings or workshops of interest):
13. Please indicate your interest in the following consultative services (check all that apply):

- Ways to Communicate Visually the Results of My Research (e.g. use of graphs, charts, infographics)
- Information on How to Develop a Data Management Plan Required by Funding Agencies
- Methods for Sharing Digital Data with Everyone via the Internet
- Best Practices for Storing and Preserving Digital Data
- Information on Ownership, Attribution and Copyright of Digital Data
- Ways to Discover and Access Other Researchers’ Digital Data
- Methods for Identifying New Colleagues with Complementary Research Interests
- None of the Above
- Other (please specify other consultative services of interest):

Demographics

14. What is your academic title?

15. Please select your college

16. What academic department, unit or area do you belong to?
17. What on campus research group, center or institute(s) are you affiliated with?

☐ Ag Safety Institute
☐ Agricultural Research Initiative (ARI)
☐ Bonderson Projects Center
☐ Brock Center for Agricultural Communication
☐ CAFES Center for Sustainability
☐ California Center for Construction Education
☐ California Institute for the Study of Specialty Crops
☐ Center for Coastal Marine Sciences
☐ Center for Excellence in Accounting Education
☐ Center for Excellence in Science and Mathematics Education (CESaME)
☐ Center for Innovation and Entrepreneurship (CIE)
☐ Center for Sustainability in Engineering
☐ Center for Teaching and Learning (CTL)
☐ Central Coast Science Project
☐ CIRM Bridges program: MS Specialization in Stem Cell Research
☐ Coastal Resources Institute
☐ Collaborative Agent Design Research Center (CADRC)
☐ Dairy Products Technology Center
☐ Electric Power Institute
☐ Environmental Biotechnology Institute
☐ Other (please specify):

☐ Geographic Information Systems (GIS)
☐ Global Waste Research Institute
☐ Graphic Communication Institute
☐ Irrigation Training and Research Center
☐ National Pool Industry Research
☐ Planning, Design and Construction Institute
☐ Poly GAIT (Laboratory for Global Automatic Identification Technologies)
☐ Polymers and Coatings
☐ Renewable Energy Institute
☐ San Luis Obispo Science and Ecosystem Alliance
☐ Science Through Translational Research in Diet and Exercise (STRIDE)
☐ SustainSLO
☐ Swanton Pacific Ranch
☐ University Center for Innovation and Entrepreneurship
☐ University Writing & Rhetoric Center
☐ Urban Forest Ecosystems Institute
☐ W.M. Keck Engineering Education Research and Development Center
☐ Western Coatings Technology Center
☐ None of the Above

Thank you for your time!

18. If you would like to be entered into a drawing for an El Corral gift certificate please enter your name and email address. The first 50 respondents will be entered into a drawing for one of two $25 El Corral gift cards. All respondents will be entered into a drawing for one of twenty $10 El Corral gift cards. After the drawing has been completed all identifiers will be deleted.

Name: 

Email Address: 

19. If you would like for us to share the results of this survey or would be willing to participate further in a focus group or case study, please enter your name and email address.

Name: 

Email Address: 
Appendix 2
The Data Studio Presents

Overview
Before The Data Studio Presents officially began, programming related to the annual celebration of GIS Day and National Geography Awareness Week allowed Library faculty and staff networking opportunities. The new speaker series provided an educational outlet to the latest research in and ideas about data. The informal format was constructed in a way that all members of the audience could take something new away. Events were free and open to Cal Poly students, faculty, and staff and local community.

The Data Studio Presents speaker series spawned from a presentation given at the grand opening celebration of the Data Studio. Quentin Hardy, Deputy Technology Editor for The New York Times and formerly Bureau Chief for the Silicon Valley at Forbes addressed the implications of big data in science, politics, society and more, in his talk “Fact as Verb: How Data is Changing Nouns Into Verbs.” The grand opening also provided Cal Poly students the opportunity to demonstrate how they were working with data. Student projects included Twitter-tracking tools to help Netflix identify service outages, and applications of spatial data in architecture and wildlife biology. The ribbon cutting was attended by the donor, Peter Wiley, Cal Poly’s President, and its Provost. The success of this event led to the idea to invite additional speakers and ultimately developed to become the most popular outreach mechanism for Data Services.

Hardy was quickly followed by MacKenzie Smith, UC Davis University Librarian, who discussed data sharing, repurposing data, citing data, peer-review of data, and formal publications whose primary purpose is to expose and describe data, as opposed to analyze and draw conclusions from it. Then Dr. Greg Bohr brought his Geography 440: Advanced GIS undergraduate and graduate students to present their final projects to the campus community in The Data Studio. There were more than ten different individual and group projects presented. This included a presentation by student on publishing his data on ArcGIS Online (this tool had only recently been released). See Table 1 for early programming and event information.

Appendix Table 1: Early event presenters name, organization, presentation title, date, and total attendance.

<table>
<thead>
<tr>
<th>Presenter(s)</th>
<th>Organization</th>
<th>Presentation</th>
<th>Date</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quentin Hardy, Deputy Technology Editor</td>
<td>The New York Times</td>
<td>Fact as Verb: How Data is Changing Nouns Into Verbs (Open House Plenary)</td>
<td>26-Apr-2012</td>
<td>&gt;150</td>
</tr>
<tr>
<td>MacKenzie Smith, University Librarian</td>
<td>University of California Davis</td>
<td>Data Papers in the Network Era</td>
<td>24-May-2012</td>
<td>17</td>
</tr>
<tr>
<td>Dr. Greg Bohr and Students</td>
<td>Department of Social Sciences, Cal Poly</td>
<td>Geography 440: Advanced Applications in GIS Student Research Papers</td>
<td>1-Jun-2012</td>
<td>27</td>
</tr>
</tbody>
</table>
Assessment
Planning and promoting events involves an investment of time and money. Subsequently a basic survey was conducted to assess attendee satisfaction, impact of attendance, gauge interest in other topics, and collect information to improve the program. Following IRB approval an assessment went forward. Immediately following a The Data Studio Presents an announcement was made asking people to take a few minutes to fill out a paper survey or take home a slip of paper with a URL to the online version.

The survey was deployed from January 2013 – February 2014 at 17 events. It consisted of 18 questions, including demographics, and took less than 5 minutes to complete. There were four types of questions in the survey: (1) those with a trichotomous response (Yes/No/Maybe), (2) those with a 5-point Likert response, (3) those where participants were allowed to select all that applied, and (4) open text response. See Appendix 3 for a copy of the online version. Based on total event attendance there was a pool of at least 400 unique respondents. Only 24 surveys were received (n=15 print; n=9 online). The issues with the response rate and bias are too numerous to unpack. However, those that responded to the survey gave similar feedback as information provided to Library and Data Services staff directly or second-hand. This non-survey feedback came via verbal interaction, email, written notes, comments on Library social media, and more. A cursory review of the survey results is presented below.

Results
In an effort to determine the best means of advertising for the speaker series participants were asked to identify how they learned about the event. It would appear as though word of mouth between friends and colleagues was the optimal means of attracting participants considering 25% of the survey participants heard of the event in that manner, with the library’s website and direct participant contact being the next most effective with response rates of 15% each (Table 2). However, how those “friends and colleagues” learned about the event was not distinguishable.

When asked why participants decided to attend an event they were given the option to check all that applied. Seventy-two percent of respondents attended the event because they were intrigued by the topic and 64% wanted to learn something new (Table 3).

What participants did with the information they learned after the event was of interest with 85% of participants reporting they discussed the topic(s) with family, friends, and/or colleagues. And 64% said they would attempt to stay up to date on the topic presented (Table 4).
Appendix Table 2: How participants learned about the Data Studio event.

Appendix Table 3: Why participants decided to attend.
Table 4: What participants did with the information they learned.

<table>
<thead>
<tr>
<th>Answer Options</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussed the topic(s) with family, friends, or colleagues</td>
<td>84.6%</td>
<td>11</td>
</tr>
<tr>
<td>Attempt to stay up to date on the topic</td>
<td>69.2%</td>
<td>9</td>
</tr>
<tr>
<td>Read a book or article about the topic</td>
<td>23.1%</td>
<td>3</td>
</tr>
<tr>
<td>Read a science magazine or journal about the topic</td>
<td>15.4%</td>
<td>2</td>
</tr>
<tr>
<td>Visited the Library’s website to access the event video/podcast</td>
<td>15.4%</td>
<td>2</td>
</tr>
<tr>
<td>Visited website(s) about the topic</td>
<td>23.1%</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>7.7%</td>
<td>1</td>
</tr>
</tbody>
</table>

The overall satisfaction level of attendees was resoundingly high. Seventy-five percent of participants stated that not only would they be interested in attending another The Data Studio Presents, but also that they would recommend attending the event to others. Not one participant who completed a survey stated they would not want to attend another event or would not recommend the event to others, with the remaining 25% in each category opting with maybe. Respondents were also provided a 5 point Likert scale to convey their general satisfaction with the event which resulted in 79% responding either completely or very satisfied, 16% fairly satisfied, and 5% somewhat dissatisfied (Figure 1).

**Figure 1: Participant satisfaction with the event.**
Discussion

Questions regarding how speakers or topics were chosen are often asked. The answer is no particular process was employed. There was quite a bit of serendipity and luck involved with securing most of the speakers. Topics were suggested to the Library directly by members of the campus and local community. Topics were suggested to Data Services staff indirectly during reference consultations, through attendance at conferences, reading news stories, reviewing journal articles, and the like.

Individuals invited to present at The Data Studio Presents represented the organizational spectrum: industry, government, academia and non-profits. Speaker name recognition ran the gambit from international, national, and local. The majority of speaker(s) were provided roughly 50 minutes to present and interact with participants, as well as to field any questions specific to the topic at hand or about data in general. To increase attendance, events were primarily scheduled on Thursdays during “university hour” in which no classes are taught on campus. Though specific open house events and internationally and nationally recognized speakers were given more time.

Table 5 provides information on the events that were included as part of the assessment and Table 6 details the events post-assessment. Although data was the underlying theme of the series, for the program to be focused solely on one subject would have been disadvantageous considering the nature of data and its continuous spread into new arenas. Current programming topics within the Library include open access, copyright, open educational resources, census data, programming, visualization, digital humanities, persistent identifiers, and more.

Even though the survey only provided a little glimpse into participants experience the exercise itself was important. Number of attendees and continued attendance at Library events does not provide any data on which to improve. A suggestion for the future would be to take the survey that was developed for this series and revisit the tool and the deployment with a campus statistician for use generally at Library outreach and workshop events. Additional participant demographic data should be collected (ex. alumni, emeriti, former employee, vacationer, community college student, parent).

Table 5: Assessment event presenters name, organization, presentation title, date, and total attendance given during survey deployment. See descriptions of the events directly below the table.

<table>
<thead>
<tr>
<th>Presenter(s)</th>
<th>Organization</th>
<th>Presentation</th>
<th>Date</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Belrose, Chief of the Western Range NGA, Vandenberg Air Force Base</td>
<td>National Geospatial-Intelligence Agency (NGA), Department of Defense</td>
<td>Military Applications of GIS</td>
<td>24-Jan-2013</td>
<td>37</td>
</tr>
<tr>
<td>Joe Larson, GIS Specialist</td>
<td>CAL FIRE (California Department of Forestry and Fire Protection)</td>
<td>Navigating OpenStreetMap</td>
<td>31-Jan-2013</td>
<td>35</td>
</tr>
<tr>
<td>Presenter</td>
<td>Affiliation</td>
<td>Title</td>
<td>Date</td>
<td>Pages</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
<td>-------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>Ron Nakao, Social Science Data Librarian and Technology Specialist</td>
<td>Stanford University</td>
<td>Working with Data at its Source</td>
<td>7-Mar-2013</td>
<td>27</td>
</tr>
<tr>
<td>Dr. Carly Strasser, Data Curation Specialist</td>
<td>California Digital Library, University of California</td>
<td>DataUp: Helping Manage and Archive Data</td>
<td>18-Apr-2013</td>
<td>23</td>
</tr>
<tr>
<td>Dr. Melissa Cragin, AAAS Science and Technology Policy Fellow</td>
<td>Office of the Assistant Director of the Directorate for Biological Sciences, National Science Foundation</td>
<td>Pioneering in the Data Frontier: Discovering the World Anew (Open House Plenary)</td>
<td>3-May-2013</td>
<td>&gt;100</td>
</tr>
<tr>
<td>Rita Blaik, doctoral student and Dr. Ruta Saliklis, Director of Exhibitions and Development</td>
<td>University of California Los Angeles and San Luis Obispo Museum of Art</td>
<td>Under the Scope: Looking at the Body Through Art and Science</td>
<td>3-Oct-2013</td>
<td>50</td>
</tr>
<tr>
<td>Dr. Carly Strasser, Data Curation Specialist</td>
<td>California Digital Library, University of California</td>
<td>Data Management for Researchers: Tips, Tools, and Why You Should Care</td>
<td>17-Oct-2013</td>
<td>9</td>
</tr>
<tr>
<td>Dr. Carly Strasser, Data Curation Specialist</td>
<td>California Digital Library, University of California</td>
<td>The DMPTool: Helping You Create Great Data Management Plans</td>
<td>17-Oct-2013</td>
<td>10</td>
</tr>
<tr>
<td>Dr. Carly Strasser, Data Curation Specialist</td>
<td>California Digital Library, University of California</td>
<td>Data Management: Who Knew It Could Be a Hot Topic?</td>
<td>17-Oct-2013</td>
<td>12</td>
</tr>
<tr>
<td>Dr. Carly Strasser, Data Curation Specialist</td>
<td>California Digital Library, University of California</td>
<td>The Future of Scholarly Research and Communication Will Be Open</td>
<td>18-Oct-2013</td>
<td>15</td>
</tr>
<tr>
<td>Dr. Carly Strasser, Data Curation Specialist</td>
<td>California Digital Library, University of California</td>
<td>Data Management for Researchers: Tips, Tools, and Why You Should Care</td>
<td>18-Oct-2013</td>
<td>7</td>
</tr>
<tr>
<td>Dr. Carly Strasser, Data Curation Specialist</td>
<td>California Digital Library, University of California</td>
<td>The DMPTool: Helping You Create Great Data Management Plans</td>
<td>18-Oct-2013</td>
<td>11</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>--------------</td>
<td>-----</td>
</tr>
<tr>
<td>Russ White, Data and GIS Specialist</td>
<td>Robert E. Kennedy Library, Cal Poly</td>
<td>Open Opportunities: Exploring Open Data</td>
<td>24-Oct-2013</td>
<td>32</td>
</tr>
<tr>
<td>Cal Poly Researchers</td>
<td>Cal Poly</td>
<td>GIS on Campus: Student, Faculty and Staff Geospatial Project Lightning Talks</td>
<td>18-Nov-2014</td>
<td>&gt;50</td>
</tr>
<tr>
<td>Russ White, Data and GIS Specialist</td>
<td>Robert E. Kennedy Library, Cal Poly</td>
<td>GIS on the Web</td>
<td>19-Nov-2013</td>
<td>4</td>
</tr>
<tr>
<td>Dr. Anne Kelly Knowles, Professor</td>
<td>Department of Geology, Middlebury College</td>
<td>Visualizing History with GIS</td>
<td>13-Jan-2014</td>
<td>135</td>
</tr>
<tr>
<td>Russ White, Data and GIS Specialist</td>
<td>Robert E. Kennedy Library, Cal Poly</td>
<td>Social Explorer: Introductory Workshop</td>
<td>20-Feb-2014</td>
<td>9</td>
</tr>
</tbody>
</table>

### Table 5 Event Descriptions*

**“Military Applications of GIS with Mark Belrose”**
Mark Belrose, Chief of the Western Range National Geospatial Intelligence Agency (NGA) Support Branch at Vandenberg Air Force Base spoke about the nation’s primary source of geospatial intelligence, or GEOINT. As a Department of Defense combat support agency and a member of the U.S. Intelligence Community, the National Geospatial-Intelligence Agency collects remotely sensed data, physical geography, land cover and cultural data around the world. He discussed how the data he has collected helps the agency’s mission partners visualize the world, support the safe navigation of land, air, and sea, as well as provide timely, relevant and accurate geospatial intelligence to support the U.S. in national defense and during natural disasters.

**“Navigating OpenStreetMap with Joe Larson”**
As a GIS Specialist with CAL FIRE (the agency responsible for fire protection in State Responsibility Areas of California, as well as the administration of the State's private and public forests), Joe Larson shared how CAL FIRE uses OpenStreetMap (OSM), an open access geographic information system (GIS) resource, to create detailed maps of the local community that include various assets and structures. He also talked about how OSM also includes mobile applications that can be used when teaching and allows users to contribute data. OSM is an open access application compared to the industry proprietary system ESRI; sharing how this free open access tool is used by the government of California effectively
provided students an opportunity to understand that after graduation they may not have access to tools with expensive licenses and that great work can still be done.

“Working with Data at its Source with Ron Nakao”
Stanford University’s Ron Nakao, Social Science Data Librarian and Technology Specialist, discussed data sharing, discovery, access, long-term preservation and metadata creation. He explained how to overcome obstacles in data archiving and about the success of the Inter-university Consortium for Political and Social Research and the Stanford Digital Repository. This helped demonstrate implementation at a college and clearly showed why it is important to deposit and share datasets with other researchers.

“DataUp: Describe, Manage, & Share Your Data with Carly Strasser”
California Digital Library’s Data Curation Specialist and DataUp Project Manager Dr. Carly Strasser discussed a free open source tool that helps researchers document, manage, and archive their tabular data via integration with Microsoft Excel. She also went into detail on libraries’ role in data education and data management in education today. This presentation provided faculty an example of how to deposit and share data in an effective but low barrier way. The library’s relationship with Strasser and overwhelming faculty interest would lead her to return for a future event.

Second Annual Open House Plenary with Melissa Cragin: “Pioneering in the Data Frontier: Discovering the World Anew”
The Data Studio celebrated its first anniversary with presentations from both students and Dr. Melissa Cragin, American Association for the Advancement of Science (AAAS) Science and Technology Policy Fellow, Office of the Assistant Director of the Directorate for Biological Science. In her talk, Cragin explored the idea that big data and data science will lead to stronger economies and new solutions for global problems, as well as the risks of big data’s presence in our daily lives. Cragin also explored how data has become universal in the modern world through tools like Google Maps and technology like smartphones, making large amounts of information available at your fingertips.

Prior to her presentation, Cal Poly students were provided the opportunity to present their own projects generating and analyzing data for future use. The students ranged from undergraduates to masters’ candidates, and again represented various colleges and majors throughout campus. A student shared her graduate research into fish populations off California’s coasts, while a mechanical engineering student’s work with a team of students to create a LiDAR-based autonomous vehicle. A student shared her work with OpenStreetMap, mapping paths, which earned her the title of one of the top 50 mappers in the United States through the program. A graduate student used GIS to map the vegetation and pronghorn antelope distribution on the Carrizo Plain, while one of the two Library GIS peer assistants showed how GIS could be utilized in city and regional planning, and within local fisheries, respectively.

“Under the Scope: Looking at the Body through Art and Science with Rita Blaik and Ruta Saliklis”
Rita Blaik, a materials engineering Ph.D. student at UCLA sat down with Dr. Ruta Saliklis, Director of Exhibitions and Development at the San Luis Obispo Art Museum, to talk about her work in the context of the burgeoning STEAM (Science, Technology, Engineering, Arts, Math) movement, which incorporates the arts into STEM (Science, Technology, Engineering, Math) subjects. This conversation was offered in partnership with the San Luis Obispo Art Museum which showcased an exhibit featuring Rita Blaik’s photography using
data from the human biome and physiology as inspiration. This program was an exciting step to show how communication can move beyond the traditional idea of numeric data, the creation of and delivery of data by engineers.

Data Management and Curation Workshops – Two Days with Carly Strasser
“Data Management For Researchers: Tips, Tools, and Why You Should Care” Researchers rarely learn about good data management practices. Dr. Carly Strasser discussed how instead they develop their own systems that are often unintelligible to others. In this talk, Strasser focused on the common mistakes that scientists make and how to avoid them, as well as provide best practices and tools for data management, which facilitate data sharing and reuse.

“The DMPTool: Helping You Create Great Data Management Plans” Many private and all government funders require that researchers submit a Data Management Plan alongside their project proposals. Strasser walked through the US based Data Management Planning Tool, the DMPTool. The online tool helps create unique research project data management plans based on specific project funders guidelines and provides links and resources for ensuring success.

“Data Management: Who Knew It Could Be a Hot Topic?” New mandates, announcements, memos, and requirements are emerging that encourage better data management, data sharing, and data preservation. In this presentation, Strasser offers a lay of the data management land by discussing recent events, resources, and new directions for data stewardship.

“The Future of Scholarly Research and Communication will be Open” Strasser posed two questions: (1) What does Open really mean for how we do science? (2) How are things changing, and what are the implications for individual researchers? She presented on all things “open” and allowed for plenty of audience discussion.

“GIS on the Web with Russ White” This was a Geography Week edition of Data Studio Presents were Russ White, Numeric and Spatial Data Specialist at Kennedy Library, presented on various GIS tools. These included tools from ESRI and Google including Google Maps Engine Lite, Fusion Tables, Google Earth, and Google Earth Engine. Plus developments to ESRI’s ArcGIS Online including new opportunities to access and share data over the web via mobile devices.

“Open Opportunities: Exploring Open Data, Tools, and Repositories to Extend Scholarship and Sharing with Russ White” As part of Open Access Week 2013 at Kennedy Library, this presentation explored Open Data, Open Source Tools, and Open Repositories; resources that provide free and timely access to data, powerful tools, as well as avenues to share data and collaborate. By exploring these tools Russ White, Cal Poly’s Library Data and GIS Specialist, discussed how one can find new data, extend technical skills, and engage in new forms of inquiry, problem solving, and collaboration.

“Visualizing History with GIS with Anne Kelly Knowles” Dr. Anne Kelly Knowles, the Professor of Geography at Middlebury College and recipient of the 2012 Smithsonian American Ingenuity Award spoke about the connections historical GIS can reveal in terms of unknown patterns and relationships between different historical events. Examples explored included the American Industrial Revolution, the Battle of
Gettysburg and the Holocaust. Note: This was an especially popular event that attracted faculty and students from multiple departments, and community members. There was standing room only and required the need for the last minute set-up of an overflow room with a display.

“Social Explorer Workshop with Russ White”
Russ White, Cal Poly’s Library Data and GIS Specialist, held a small workshop on how to use Social Explorer, a licensed demographic data resource. He explained how Social Explorer provides quick and easy access to current and historical census data and demographic information. He reviewed in detail the easy-to-use web interface that lets users create maps and reports to illustrate, analyze, and understand demography and social change. Note: This tool was licensed by the Library when the unit realized there was a need for this data interface based on the types and number of reference questions.

Table 6: Post-assessment event presenters name, organization, presentation title, date, and total attendance post assessment. See descriptions of the events directly below the table.

<table>
<thead>
<tr>
<th>Presenter(s)</th>
<th>Organization</th>
<th>Presentation</th>
<th>Date</th>
<th>Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Josie Iselin</td>
<td>Loving Blind Productions</td>
<td>Art, Science and the Natural World - The Seaweed Specimen</td>
<td>6-Feb-2015</td>
<td>12</td>
</tr>
<tr>
<td>Jon Jablonski, Director</td>
<td>Map and Imagery Laboratory, University of California Santa Barbara</td>
<td>Geospatial Data: Where does it go?</td>
<td>12-Feb-2015</td>
<td>35</td>
</tr>
<tr>
<td>Dr. Zachary Peterson, Assistant Professor</td>
<td>Department of Computer Science and Software Engineering and Cybersecurity Center, Cal Poly</td>
<td>Cyber CSI: Working to Solve the Data Security Crisis</td>
<td>16-Apr-2015</td>
<td>48</td>
</tr>
<tr>
<td>David Yun, GIS Supervisor and Lecturer</td>
<td>City of San Luis Obispo and Department of Natural Resources Management, Cal Poly</td>
<td>Historic San Luis Obispo Shared Through GIS</td>
<td>30-Apr-2015</td>
<td>54</td>
</tr>
<tr>
<td>Jenny Kendler, Artist-in-Residence and Dr. Ruta Saliklis, Director of Exhibitions and Development</td>
<td>Natural Resources Defense Council (NRDC) and San Luis Obispo Museum of Art</td>
<td>Bewilder</td>
<td>Be Wilder – the Natural World and Art</td>
<td>30-Mar-2016</td>
</tr>
</tbody>
</table>
Table 6 Event Descriptions*

“The Seaweed Specimen”
Josie Iselin, a photographer, writer, and book designer based in San Francisco, talked about her work in the context of the STEAM (Science, Technology, Engineering, Arts, and Math) movement. The focus of her presentation was her 2014 book featuring seaweed, An Ocean Garden, and her infatuation with seaweed as a subject. Throughout her talk Iselin named collaborators, artists, scientists, curators and writers who have inspired her work.

“Geospatial data: Where does it go?”
Jon Jablonski, head of University of California Santa Barbara’s Map and Imagery Laboratory, gave a talk that discussed the status of building geospatial libraries for storage, discovery, and access in an academic setting. His work revolves around the management of large bodies of worldwide spatial information and practical applications of geodata, so naturally, this discussion focused on UCSB’s efforts to spatially enable the new Alexandria Digital Research Library. In addition, he discussed Stanford University’s Geospatial Center and Harvard’s Geospatial Library.

“Cyber CSI: Working to Solve the Data Security Crisis”
Dr. Zachary Peterson, Assistant Professor in the Cal Poly Computer Science Department and Cybersecurity Center, discussed the security implications of data storage systems and issues with encrypting mobile device data. Specifically, he addressed the challenges of digital forensics, a branch of forensic science encompassing the recovery and investigation of material found in digital devices, often in relation to computer crime. In addition, he spoke about cryptography as a means of protecting our information and its rise as one of the most popular ways to protect digital data in the past 20 years.

“Historic San Luis Obispo Shared Through GIS”
David Yun, Lecturer for Cal Poly’s Natural Resources Management and Environmental Sciences (NRMES) and City of San Luis Obispo Geographic Information Services Supervisor, discussed how the scanning of historic maps and documents using GIS tools has provided new ways to visualize and connect to information from the past. Yun demonstrated online mapping and web apps to show users how to find and view historic buildings, chart the growth of the city over the decades, and compare side-by-side maps of San Luis Obispo as it is today with as it was more than 100 years ago. Specifically, Yun discussed how the scanning of San Luis Obispo historic documents and maps provides easy access and management of this information.
“Cyber CSI II: Apple vs. FBI – Encryption, Privacy, and Policy” (Joint Science Café/Data Studio Presents)
Dr. Zachary Peterson, Cal Poly Assistant Professor of computer science and a faculty member of the university’s Cybersecurity Center, returned to provide a second program on Cyber CSI. Peterson used issues being discussed in the media surrounding the court case between Apple and the FBI regarding the December 2015 domestic terrorist attack in San Bernardino, California, to delve into the implications of encrypting data on mobile devices, and the challenges of maintaining data privacy in the digital age. He also examined the implications of the high-profile case for both government policies and the private sector.

“Jenny Kendler: Bewilder | Be Wilder – the Natural World and Art”
The presentation featured a conversation between Jenny Kendler, nationally and internationally recognized interdisciplinary artist, environmental activist, wild forager, naturalist, and social entrepreneur and Ruta Saliklis, San Luis Obispo Museum of Art Exhibitions and Development Director, about the intersection of art, activism, and the natural sciences. Kendler was the first Artist-in-Residence with the Natural Resources Defense Council (NRDC) and is based in Chicago.

“The Intersection of Science and the Art of California’s National Parks”
Leslie Love Stone, Paso Robles based artist, sat down with Ruta Saliklis, Curator and Director of Exhibitions at the San Luis Obispo Museum of Art, to talk about the painter’s work and California National Parks in the context of the STEAM (Science, Technology, Engineering, Art, Math) movement. Ms. Stone consulted with a Cal Poly botanist, soil scientist, and data and GIS specialist, to transform data about the natural world into geometric shapes using her own numeric representation system and book cipher algorithm. The result was a series of paintings of nine national parks in California.

* Event descriptions have been paraphrased or directly quoted from the Library and Cal Poly websites. These descriptions were written by or based on the authors descriptions of the events.
Appendix 3  
The Data Studio Presents Participant Online Survey

<table>
<thead>
<tr>
<th>Perspectives of Data Studio Event Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction and Informed Consent</td>
</tr>
</tbody>
</table>

A research project on perspectives of Cal Poly State University Data Studio event Presenters and Participants is being conducted by Jeanine Scaramozzino, Data Services Librarian, California Polytechnic State University – San Luis Obispo. This online survey has been developed to collect data on the perspectives of Cal Poly State University Data Studio event Participants and Presenters (1) on the effectiveness of programs, (2) their satisfaction with the experience, and (3) to collect new ideas to improve the program.

You are being asked to take part in this study by completing the following questions. Please be aware that you are not required to participate in this research and you may discontinue your participation at any time without penalty. You may also omit questions that you would prefer not to answer. The risks associated with participation in this study are no more than the participant would encounter in everyday life.

Your responses will be kept anonymous. The results of the survey will be aggregated and shared as a whole. If you have questions regarding this study or would like to be informed of the results when the study is completed, please feel free to contact: Jeanine Scaramozzino, College of Science & Mathematics, School of Education, and Data & GIS Services Librarian, California Polytechnic State University – San Luis Obispo, at jscaramo@calpoly.edu.

If you have concerns regarding the manner in which the study is conducted you may contact Dr. Steve Davis, Chair of the Cal Poly Human Subjects Committee, at 756-2754, srdavis@calpoly.edu, or Dr. Dean Wendt, Interim Dean of Research, at 756-1508, dwendt@calpoly.edu.

This survey contains 18 questions and should take about 5 minutes to complete. Thank you for your participation in this research.

If you agree to voluntarily participate in this research project as described, please indicate your agreement by marking “Yes” next to the statement “I am voluntarily participating in this survey”. Please print and retain this informed consent form now for your reference.

1. I am voluntarily participating in this survey:
   - [ ] Yes
   - [ ] No

2. Have you attended any Data Studio events, presentations, or workshops?
   - [ ] Yes
   - [ ] No
3. If you answered yes to the previous question, please specify which program(s) you’ve attended:

- Data Studio Grand Opening
- Quentin Hardy - New York Times, "How Data is Changing Nouns into Verbs"
- MacKenzie Smith - UC Davis Librarian, "Data Papers in the Network Era"
- Geography 440 Final Project Presentations
- Mark Beirose - NGIA, "Military Applications of GIS"
- Joe Larson - CAL FIRE, "OpenStreetMap"
- Ron Nakao - Stanford, "Working with Data at its Source"
- Carly Strasser - California Digital Library, "DataUp"
- Melissa Cragin - National Science Foundation, "Making a place for Data"
- Data Studio Open House 2013
- Rita Blaik, UCLA, and Ruta Saliklis, SLOMA - "Under the Scope: Looking at the Body Through Art & Science"
- Carly Strasser - California Digital Library, "Data Management for Researchers"
- Carly Strasser - California Digital Library, "The DMPTool"
- Carly Strasser - California Digital Library, "Data Management: Who Knew It Could Be a Hot Topic?"
- Carly Strasser - California Digital Library, "The Future of Scholarly Research & Communication Will Be Open"
- Other

Other (please specify)

4. How did you find out about the Data Studio event? (Check all that apply)

- We contacted you
- You contacted us
- Facebook page/ad
- Poster
- Newspaper/Mustang Daily
- Podcast/radio
- Other (please specify)

- Library Website
- Colleague/Friend
- Library announcement
- Blog
- Cal Poly Report
- Data Studio Email List
5. Why did you attend? (Check all that apply)

☐ To learn something new
☐ Intrigued by topic
☐ Interested in speaker
☐ Informal venue for discussion
☐ Extra credit for class
☐ Class requirement
☐ Moral support for speaker
☐ Other (please specify)

☐ I was invited
☐ Just curious
☐ Killing time
☐ Food/coffee
☐ Club support
☐ Past presenter at the Data Studio
☐ I enjoyed a previous event

6. What, if anything, did you do as a result of attending the Data Studio event? Check all that apply.

☐ Discussed the topic(s) with family, friends, or colleagues
☐ Attempt to stay up to date on the topic
☐ Read a book or article about the topic
☐ Read a science magazine or journal about the topic
☐ Visited the Library’s website to access the event video/podcast
☐ Visited website(s) about the topic
☐ Other (please specify)

7. Would you be interested in attending another Data Studio Event?

☐ Yes
☐ No
☐ Maybe

8. Would you recommend attending to others?

☐ Yes
☐ No
☐ Maybe
9. Please rank your overall satisfaction with the Data Studio event experience:

<table>
<thead>
<tr>
<th></th>
<th>Completely Satisfied</th>
<th>Very Satisfied</th>
<th>Fairly Well Satisfied</th>
<th>Somewhat Dissatisfied</th>
<th>Very Dissatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Please indicate the extent to which you agree/disagree with the following:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>There were sufficient opportunities for active learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There were sufficient opportunities for interaction among participants.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can implement what I learned at this presentation/workshop.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would recommend this presentation/workshop to a colleague.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. How could the event be improved?

   

12. Which part of the event was most useful to you?

   

13. Which topic(s) or presenter(s) would you like to see in a future event?

   

77
14. Gender:
- Male
- Female

15. Age:
- 17 and under
- 18-24
- 25-34
- 35-49
- 50-64
- 65 and older

16. What is your position at Cal Poly?
- Lecturer
- Assistant professor or equivalent
- Associate professor or equivalent
- Professor or equivalent
- Management program position (MPP)
- Undergraduate student
- Graduate student
- Staff member
- Community member
- N/A
- Other (please specify):

17. Department/College:
- COSAM
- CLA
- CENG
- OCCB
- CAED
- CAFES
- Library
- University Advancement
- Athletics
- Cal Poly Corporation
- Continuing Education
- Information Services: IT and Library
- President’s Office
- Provost’s Office
- Student affairs
- Administration and Finance
- N/A
- Other (please specify):
18. Years on Cal Poly Campus:

- 1
- 2
- 3
- 4
- 5
- 6-10
- 11-15
- 16-20
- 21+
- N/A

19. Optional: If you would like to be notified of future Data Studio or GIS events, please provide your name and email.

Name

Email

20. Optional: If you would like to be entered in a drawing for a Starbucks coffee card, please provide us with your name and email.

Name

Email

Thank you for participating in this survey, your responses are greatly appreciated.