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INSIDE: PUBLIC LIBRARY RESPONSES TO COVID

PLUS: MUSEUMS, STEM, AND SOCIAL ISSUES, SEIZING NEW OPPORTUNITIES, MAKING MINING MODERN AGAIN, AND MORE!

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book collection, specimen photos, and original art from our talented marketing team. Using print-on-demand technology, we will have the ability to create a wide range of products using our collections. The new shopping site will be live after the holidays so that we can test our system before it goes public.

We continue on our quest to save energy, which is both a moral imperative for a natural history museum and good business sense. We adjusted our building hours during the closure to avoid running the AC in the hottest part of the day, and given the length of the closure, also the hottest part of the year. Grants and gifts helped us install two new efficient HVAC units, replace 150 HEPA air filters, and continue switching our light bulbs to LED.

Our equity and inclusion work will be a long-term, ongoing effort. We made progress on examining internal policies and procedures, and surveying staff to understand experiences with inclusion and diversity. Although our hiring was minimal during this period, we sought diverse candidates for grant funded positions that arose.

It has not been easy operating during the pandemic. Team-based project development was more difficult with everyone working remotely. Many projects required help from a limited number of IT and communications staff, and we had to develop in-house capabilities for filming and editing. Even with most of our full-time staff on board we

could have used additional help, and as usual, everything took considerably longer than we anticipated. Even with these challenges, we accomplished a considerable amount and made great progress toward re-imagining the Museum.

Every organization has its own history and constraints. The Manifesto and our progress at The Nat are part of our reflection and planning as we approach our 150th anniversary in 2024. Ultimately, we want to position the organization for success over the next 150 years. The pandemic provided an unanticipated and unwanted break from our normal operations, and our staff responded with resourcefulness and creativity. With no end to the pandemic in sight, we will continue to make the best of our closure time by being productive and continuing to experiment and improve.

Judy Gradwohl is the President and CEO of San Diego Natural History Museum. You can learn more about their work at:

<http://www.sdnhm.org/>

<https://www.facebook.com/SanDiegoNaturalHistoryMuseum>

<https://twitter.com/SDNHM>

<https://www.instagram.com/sdnhm/>

<https://www.youtube.com/user/SDNaturalHistory>

PUBLIC LIBRARY RESPONSE TO COVID: PART 1

By Stephanie Vierow-Fields, Anne Holland and Paul Dusenbery

This is the first of a 2-part series about the changes that have taken place in how public libraries adapted to COVID-19. Part 1 focuses on what libraries were doing prior to pandemic, the challenges that they faced due to COVID-19, and how they pivoted to a “new normal” way of doing things. Part 2 will focus on innovations in programming and professional development that have helped to strengthen the library profession.

1. OVERVIEW OF PUBLIC LIBRARIES IN THE U.S.

Communities increasingly value their public library as a hub for lifelong learning, and library programs and services continue to evolve to meet the needs of diverse learners, including in STEM. In 2016, there were 1.4 billion in-person visits to the 16,560 public libraries and 647 bookmobiles in

the U.S. (IMLS, 2018). This is equivalent of about 4 million visits each day. See Figure 1 for a geographic distribution of public libraries in the U.S. Public programming expanded 17% since FY2012; in 2016, public libraries offered 4.70 million programs across all age bands and on a variety of topics, which were attended by over 113 million people. A recent Gallup poll (Gallup, 2019) found that “visiting the library remains the most common cultural activity Americans engage in,” far surpassing going to a movie theater or live sport events. The poll also found that women were twice as likely to visit a library than men, and low-income Americans visited more often than those with higher incomes.

STEM disciplines and careers are an increasing focus of

Figure N-1. Public Library Administrative Entities in the United States, Fiscal Year 2016

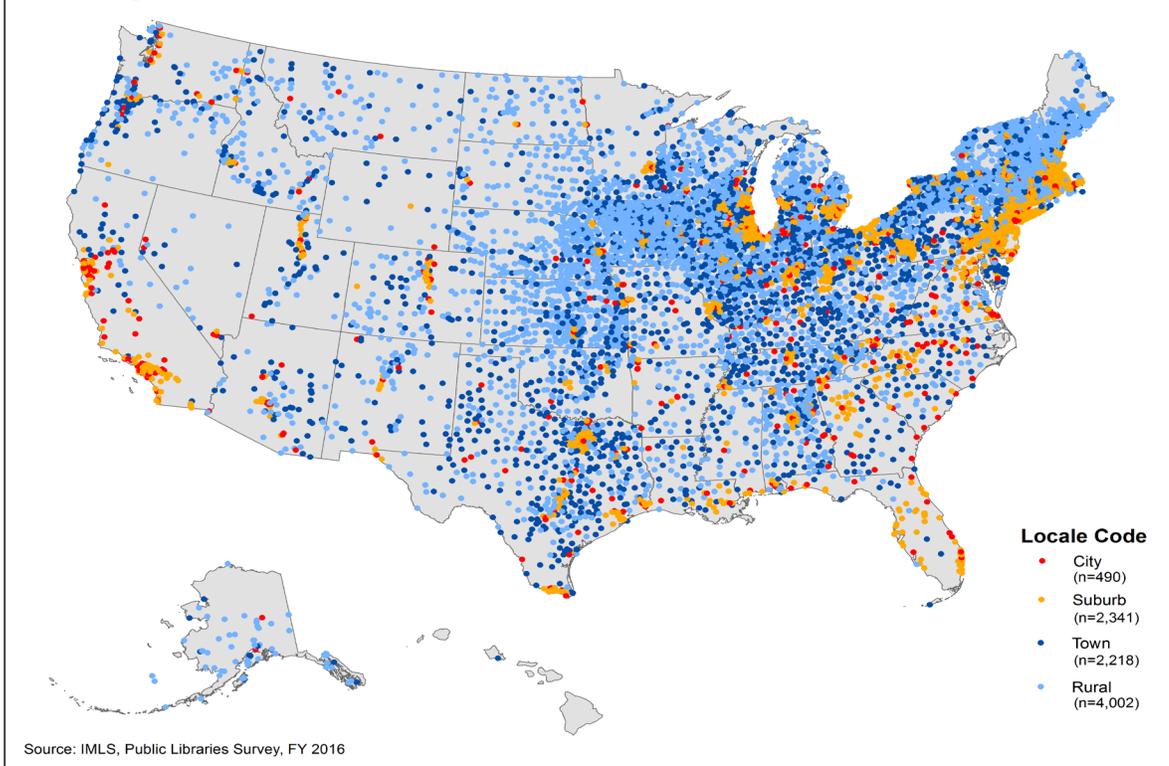


Figure 1: Distribution of Public Libraries in the United States, Fiscal year 2016. Credit: Public Library Association.

public library programs. These informal, free-choice institutions (National Research Council, 2009) are creating maker-spaces, hosting STEM exhibits, and offering hands-on STEM activities. They provide STEM programs on their own, or in partnership with other libraries, museums, businesses, and schools. Building the capacity of public libraries and library staff to deliver engaging, inspirational, and educational STEM programs has the potential to transform the STEM education landscape across the country (Dusenbery, 2014). What began years ago as experiments in STEM library pro-

gramming has become a national STEM education movement (Shtivelband et al., 2017).

Libraries go far beyond the use of science-related books in their programming, incorporating hands-on activities, collaborative small-group work, and deliberate use of vocabulary and/or questioning strategies. The arts (including design and computational thinking programs) are often integrated into STEM (i.e., STEAM) to attract interest and enhance creativity. Researchers on STAR Net’s NSF-funded Phase 2 project found that many library staff prefer to use STEAM rather than STEM (Shtivelband and Jakubowski, 2018), and “STEAM” is the focal point for key educational efforts led by professional library associations and organizations. For example, the Young Adult Library Services Association (YALSA, a Division of ALA) developed a STEAM programming toolkit to help library practitioners successfully integrate STEAM into their programming and services (YALSA, 2016). Art skills such as design thinking and visual literacy are valuable transdisciplinary skills that can improve STEM programs like building computational literacy.

These approaches align with critical 21st Century skills of creativity and innovation, critical thinking and problem solving, and cross-disciplinary thinking and core values of librarianship (Maine State Library, 2014). They also align with recent recommendations from America’s Strategy for STEM Education (White House, 2018).



Figure 2: A virtual STEM program featuring a scientist. Credit: NCIL/SSI.

Libraries Broaden Participation to Reach Underserved Audiences. Public libraries are particularly ideal for reaching populations underserved and underrepresented in STEM-related fields. Public libraries serve people of all races, ages, and socio-economic backgrounds and are re-envisioning their mission and role in the community to be more inclusive and sustainable; libraries serve as “on-ramps” to STEM learning by creating environments that welcome newcomers to their community.

In 2013, the Pew Research Center conducted a survey of over 6,200 Americans to learn about how people utilized public library services. The Pew survey found that 91% of Americans ages 16 and older say public libraries are important to their communities and are an important education resource, and 76% say libraries are important to them and their families. African Americans (60%) and Hispanics (55%) are more likely to say that libraries are “very important” to them and their families compared to Caucasian families (41%). Study findings indicated that Americans view public libraries as places that help improve literacy and the quality of life by providing resources, benefits, access to materials, and youth programming. Groups underrepresented in STEM (women, African Americans, Latinx, and individuals of low socioeconomic status) were more likely to rate these library services as very important (Pew Research Center, 2013).

2. LESSONS LEARNED FROM THE STAR LIBRARY NETWORK

The STAR Library Network (STAR Net) functions as a national professional network focused on STEAM learning in libraries (Dusenbery et al., 2020). *STAR Net* helps library professionals facilitate STEAM programs for their patrons by providing “science-technology activities and resources” (STAR) and training to use those resources. Over the past decade, *STAR Net* has been a leader in supporting libraries in developing effective STEAM programs, through both NSF and NASA-funded projects such as *STAR Net* Phase 2, Project BUILD, and *NASA@ My Library* 1.0. Over 8,000 library and STEM professionals have joined *STAR Net*’s community of practice (CoP) to access webinar trainings, monthly newsletters, professional blogs, partnership opportunities, facilitation guides, and to take advantage of its *STEM Activity Clearinghouse* resources.

Sixty-five urban and rural U.S. public libraries and eighteen state libraries were selected to join *NASA@ My Library* in 2017. Partners worked with *NASA@ My Library* project organizations and NASA to increase and enhance STEM learning opportunities for millions of library patrons throughout the nation, including geographic areas and populations that are currently underrepresented in STEM education. Forty-five states are represented including Alaska and Hawaii. As members of *NASA@ My Library*, they

received resources such as facilitation and check-out kits, trainings including workshops and webinars, and other support from *STAR Net* staff.

An important *NASA@ My Library* strategy, which has engaged thousands of libraries over the past few years, has been the support of national STEM events such as the 2017 solar eclipse and the 2019 anniversary of the Apollo Moon landing. As part of the 2017 solar eclipse, *STAR Net* coordinated the distribution of 2.1 million solar viewing glasses that were distributed to 4,000 library organizations (representing more than 7,000 individual library locations) across the U.S., along with critical safety information and valuable programming ideas (Dusenbery et al., 2017). Participating libraries conducted approximately 35,000 science programs before and during the eclipse, reaching an estimated 1,750,000 children and adults. Figure 3 shows a program in South Carolina.

In 2019, thousands of public libraries participated in a summer learning program called Summer of Space/



Figure 3: 2017 Eclipse Observers. Credit: Georgetown County Library System, South Carolina.

Universe of Stories in partnership with the Collaborative Summer Library Program (CSLP), state libraries, and NASA. Over 4,800 libraries registered on *STAR Net*’s *Summer of Space* webpage. See Figure 4 for a reach map showing their geographic locations. Resources and training included *STAR Net*’s *STEM Activity Clearinghouse*, webinars, and sessions at a variety of library conferences (Vierow-Fields et al., 2020).

The COVID-19 pandemic is another type of event that has transformed libraries and their communities in a myriad of ways from learning how to deliver essential assistance safely to pivoting their in-person programming to on-line versions. These changes will likely have impacts far beyond the period that COVID-19 is a threat. *STAR Net*’s experience with providing support to libraries for national

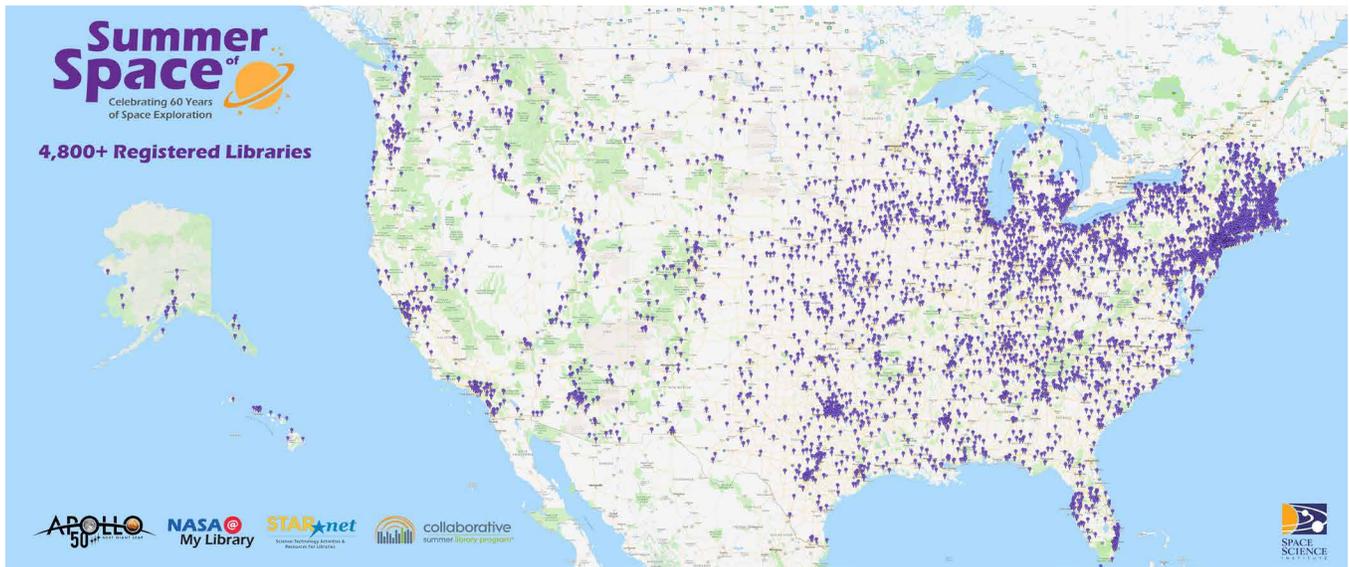


Figure 4: 2019 Summer of Space Reach Map. Credit: NCIL/SSI.

STEM events like the ones described here, provide a strong foundation for confronting COVID-19. It has the experience with managing large-scale events and the trust of the library community to deliver quality programs. This paper, and its companion, address some of the important lessons that the authors have learned working with libraries across the country during this period of great disruption.

3. IMPACTS OF COVID-19 ON PUBLIC LIBRARY OPERATIONS

Before the COVID-19 pandemic that swept the United States beginning in March of 2020, libraries provided a variety of resources to the public including access to onsite social workers, hands-on educational programming, and innovative digital learning. Many were open seven days a week with several staff members to assist patrons with everything from job applications, internet access for homework, or a safe space between school and home.

The COVID-19 pandemic has had a profound impact in library operations, like it has for so many informal learning institutions. Since the first documented cases in January 2020, many public libraries across the country have shuttered their doors, furloughed workers, and ceased in-person programming. Closings had the largest impact on library operations. According to the Public Library Association survey conducted between March 24 – April 1, 2020, 98% of libraries had closed to the public (Public Library Association, 2020). Within that demographic, 35% expected to be closed indefinitely while 47% expected to be closed between two weeks to two months.

These closures didn't just impact libraries. Museums, zoos, community centers, afterschool programs, and recreation centers were all shuttered due to this invisible virus. The

availability of informal learning institutions to continue STEM education using the strategies that they had developed over decades (e.g., hosting traveling exhibitions, offering in-person programs, conducting outreach to schools) was lost overnight. For many in the profession as well as partners and community advocates, the question remained what could they do and how long was the pandemic going to last?

Public libraries have been in a unique position to respond to the pandemic challenge (see Figure 5). Because of government shutdowns, 76% of libraries have extended their online renewal policies, 74% expanded online check-out services, and 61% added virtual programming (PLA, 2020). The expansions in outreach and facilities kept libraries engaged with their communities while also following CDC guidelines. The fact that libraries were able to continue many of their pre-COVID activities also provided an important lifeline for community members to still access vital supports. Figure 5 lists some of the activities that libraries planned to do in response to the closures.

Public libraries have helped local governments with their relief efforts. For example, they have produced personal protective equipment for health workers and first responders (such as 3D printed face masks and shields); offered meeting space for emergency operations; and staged areas for food and other distribution efforts. While providing these vital aids, libraries also continued to conduct community outreach efforts ranging from virtual storytimes to wellness checks on homebound elderly patrons. For more information about the survey, please go to [Public Libraries Respond to COVID-19: Survey of Response & Activities | Public Library Association \(PLA\) \(ala.org\)](https://www.pla.org/2020/03/24/public-libraries-respond-to-covid-19-survey-of-response-activities).

PUBLIC LIBRARY ACTIVITIES

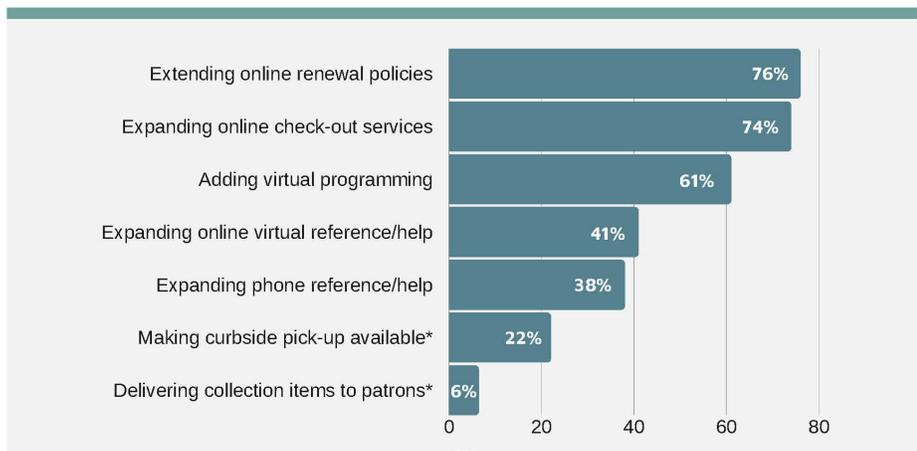


Figure 5: The Public Library Association survey provided a list of response options for libraries to describe new or expanded services. Credit: PLA.

A COVID Response survey of fifty of the sixty-five NASA@ My Library sites in May 2020 echoed similar results to the PLA survey. This survey showed that 70% of sites were closed to the public with only 29% offering curbside or remote programming. Along with questions about library operations, topics such as virtual programming, continued checkouts, and professional development helped STAR Net staff develop pivots to support libraries through the pandemic. Most responses showed the dramatic impact COVID-19 had on operations, and ways library partners were looking for supports such as hosting virtual programs with NASA scientists, connections to community partners, and webinars geared toward hosting virtual programs (much of this is described in Part 2).

Libraries have helped their communities in other ways even as staff members faced furloughs and reduced hours. As seen in Figure 6, only a third of libraries kept their normal hours. Between the adjustments to assisting local governments, working with new partners, and shifting programs, the workload and reduced hours has had a high impact on library operations. As one library staff member explained in the NASA@ My Library COVID Response Sur-

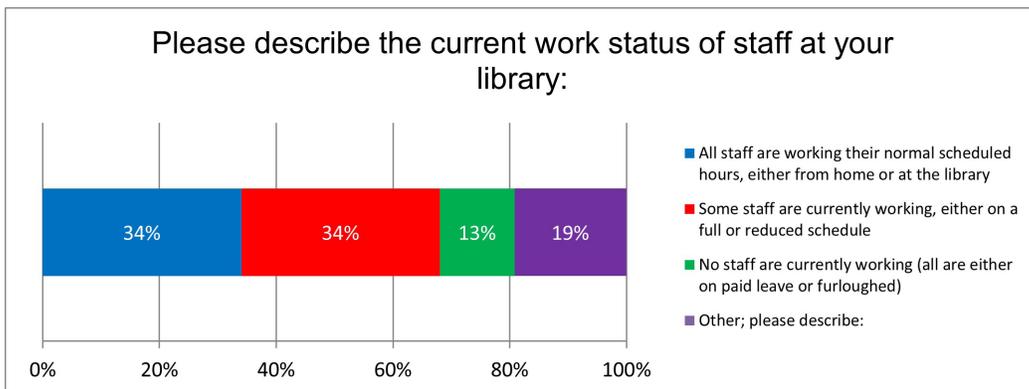


Figure 6: NASA@ My Library COVID Response Survey. Credit: NCIL/SSI.

vey, “We are working from home and on site with various schedules. We have door service 7 days a week from 2-6pm. Otherwise most are working from home except like me who do the finances and cannot do them from home.”

Virtual programming is the biggest shift libraries have been forced to make due to the pandemic. Pre-COVID, library staff expressed apprehension about virtual programming. It was not a well utilized type of program, usually a once in a while event. However, because of the shutdowns to in-person interactions due to COVID-19, the shift has caused complications among library staff. When asked if their library was interested in facilitating virtual/online STEAM activities, 90% of libraries in the NASA@ My Library project answered yes. In their comments, however, some expressed hesitancy to the implementation.

“We are in a unique position, being in a very small temporary location that makes programming extremely challenging, even before the pandemic closure. A combination of in-person and online programming might be the best (or only!) way to accomplish our goals.”

“Yes, but our library has lower internet speeds and because we are so rural and economically depressed many of our families do not have access to internet services.”

“About the only on-line program thus far that has garnered much enthusiasm has been our Children’s Storytime. Right now, I think kids and parents are both overwhelmed with on-line school and kids are kind of cooked. I am not sure this would be successful until summer, and then it’s a maybe, but I would be willing to try.”

Moving from in-person programming to virtual in a matter of weeks has exacerbated several challenges for library staff. As seen from Figure 7, the largest issue with the switch from in-person to virtual is the limited internet access for patrons.

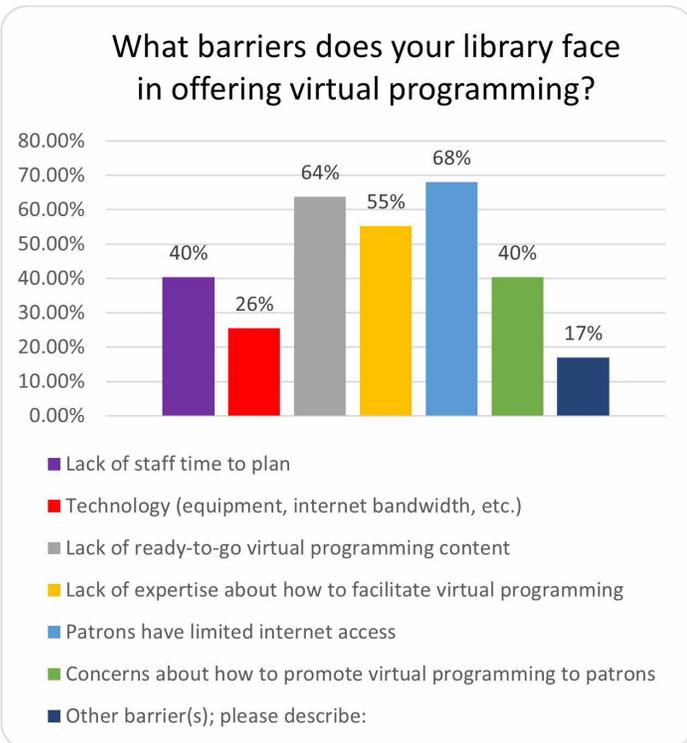


Figure 7: NASA@ My Library COVID Response Survey. Credit: NCIL/SSI.

A secondary barrier during the COVID-19 pandemic was the lack of ready to go virtual programming content. As described above, virtual programs were a one-off feature in library programming; an opportunity to interact with a high-profile event such as an Educational Downlink with a NASA astronaut or when a scientist called into a rural community to present about their science (see Figure 2). During the pandemic, libraries struggled because they did not have enough content to host virtual programs frequently (daily or weekly). They were limited on time to plan, lack of experience on hosting virtual programs, and unsure how to promote them. As described in Part 2, while the shift was initially difficult, libraries have made great strides in adapting to virtual programs.

Finally, a shift to curbside distribution dramatically influenced libraries during the pandemic. With the ability to provide tangible resources, libraries have continued to reach their audiences through Take and Make kits and activity guides. Their distribution also allowed for interactions with new community partners including food banks, school districts, and community centers.

After nine months since the start of the pandemic, libraries
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Figure 8: Take and Make activity. Credit: Gwinnett County Public Library, Georgia.

have adjusted to hosting more virtual programming. They are utilizing partnerships, pre-recording programs, and even participating in virtual conferences for professional development. While their hours are cut, their buildings shut down, or they are forced to work from home, library staff have shown a great resiliency in keeping their operations from suffering greatly. These shifts highlight the adaptability of library staff to address their community needs.

Part 2 will focus on various ways that libraries have evolved to meet the challenges associated with COVID-19. What kind of programs are libraries able to do? How are library staff keeping up with their training needs? It will also report on the strategies used by STAR Net to support libraries during this time of crisis.

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MUSEUMS, STEM, & SOCIAL ISSUES: AN ONGOING CONVERSATION

By Kris Morrissey, Theresa Ball and John Fraser

SUMMARY

Addressing Societal Challenges through STEM is an NSF-funded study to examine how informal STEM learning institutions are engaging with and addressing the challenges facing society and how STEM knowledge is situated within those efforts. Initial results suggest that ISL institutions are addressing some topics, such as climate change

and health, but avoiding other topics, such as economic disparity and issues of gender identity. Most projects focus on impacting individuals' understanding of the problem and motivation to change behaviors that may contribute to the problem; Only a few look at the complex societal factors at play and how individuals might affect systemic change. Collaborations are common but primarily between