

Themes and Vignettes

BI as a focal point of the partnership. In what ways did the partnership change the way you think about your own organization's approach to BI or BI support? In what ways did individual PIs learn or improve their practice? How did you or your organization learn or improve your BI practice?

1. New York

Through our ongoing work to elevate the quality and outcomes of Broader Impacts work in the community, we have discovered one quality that tends to result in better (and more apt to be funded!) community engagement initiatives: clear planning and thoughtfulness in the pre-proposal stage. At the Sciencenter, we provide myriad opportunities for researchers to engage with the public, such as working with our summer camps, engaging our middle school Future Science Leader program, developing outreach programs for rural audiences, or engaging with adults in the community to improve science literacy.

As we strengthen our ties with the research administration community at Cornell, we have had more opportunities to engage with faculty in the pre-proposal stage, and assist with the development of their broader impacts work. At this early stage, without the pressure of a looming grant submission deadline, we can invite researchers to participate in our programming as a "trial run" for their later BI work, and to see what kinds of programming or topics might work best for both parties. These early opportunities allow researchers to collect "pilot data" for their BI work, which they can write into their proposals to strengthen their credibility both in their research, and within their chosen field of BI.

We have streamlined our own side of the process with the help of a BI Menu. Since our end goal for this partnership is institutionalization on both sides, we prepared a menu with descriptions of the types of programming that we already offer that are good fits for researcher collaborations. Most crucially, our BI Menu includes prices. This allows for clear communication and concrete expectations for both sides when planning collaborative BI work. As the ISE, we can make sure that all proposed work fits into our mission and within our capacity, and the PI understands the true costs associated with this work, which often causes them to place higher value on the partnership.

2. California

Before the Fleet Science Center had a chance to be part of the Broader Impact Design Study, BI opportunities were not something we actively sought out. Oftentimes opportunities came about either because a scientist who participated in one of our outreach opportunities had a grant coming up or a PI happened to specifically look for partners and found us through an online search or received a recommendation from a colleague. But now, through the relationship the Fleet Science Center has formed with UCSD's development office, BI opportunities are much more curated and carefully planned. Our partner, Sharon Franks in the UCSD development office, reviews grants coming through her office and makes a specific case to PIs to partner with the Fleet to strengthen the BI part of the grant. This has allowed us to be much more pro-active in setting up the partnership and the BI opportunities. While before, scientists often reached out to us last minute, with Sharon's help, we now start working with the PI months before the grant application is due. Working with Sharon and her office also helps to keep both the PI and the Fleet on track and in constant communication. The partnership with UCSD has also helped us to understand that fostering strong partnerships with local PIs and to increase BI partnership opportunities takes a lot of time and a dedicated resource / staff member. Before participating in

the BID, there was no one person in charge of BI partnerships, that has since changed. Our partnership with Sharon has also helped us understand how important a BI menu or overview is. Since very few PIs are familiar with the Fleet Science Center and the work we are doing, having an official document outlining the various already existing BI opportunities has very much streamlined the process. Since working with Sharon and various PIs we have continuously found ways to improve the menu.

3. New Hampshire/Vermont

The relationship of Dartmouth and VINS has existed over the years, but the BID project has created a new or modified relationship. It has allowed VINS as an organization to reflect on all of the ways that we have partnered in the past through outreach and beyond. The BID project has also led us to deepen our connection to create a longer lasting partnership rather than typical ad hoc relations we may have defaulted to in the past. This work and program has also led into the sustainability of the relationship between Dartmouth and VINS. Through a suggestion of the project, the BID work has now been integrated and become a part of a specific position at VINS. Even if the person (myself) leaves this position, the work will be continued and fulfilled through another person that would take on this role. Adding this piece to this job position allows VINS to become accountable for all Broader Impact work and to become a reliable partner that Dartmouth can count on. Also, not only will the person whose job it is to continue the work for the BID project, but they will continue to connect with others at the VINS organization as well. There is a team of core individuals at VINS that play a role in the future of this project and to keep it sustainable; there is an obvious need for that team to stay established.

One thing that this has all highlighted has been the issue of resources, specifically personnel resources dedicated toward the partnerships. In working to develop a community of applicants and partners I've really struggled to manage all the work that needs to be done to put this ecosystem in place as my position for this is about .3 FTE, and I feel that has been somewhat noticeable in the local organizations we have tried to partner with. Those who are successful in managing a grant with faculty, and I count VINS in this group, have someone who has this as part of their job description. In other places it is often whomever picks up the email that I end up working with, or sometimes there is only one person in the entire organization.

Internally, I think there is a real interest in pursuing the broader impact piece, and interestingly this year that began to develop more around academic and research broader impacts, so in many of the BI workshops for faculty that I ran, I found the faculty who participated were more interested in making connections with faculty who are already recipients of the award and learning from their broader impact work rather than looking to partner externally. This was a noticeable change from previous years, and in terms of the inquiries I receive from the faculty the interest has definitely skewed toward that strand of the BI outcomes. I think this points to the fact that faculty are now more aware of the importance of the efficacy of a BI narrative and successful project, whereas in previous years they saw me as the sole resource, now they are aware there is a much broader support network around them, such as current NSF CAREER recipients, external partners, and other outreach projects and programs on campus that they can tap into. This, to me, indicates success as evidenced by a growing ecosystem of support, and also an increase in knowledge of that support.

4. Wisconsin

The Wisconsin BID team built upon, expanded, and refined existing outreach and engagement programs and networks as well as forging new partnerships at UW-Madison. This vignette will

describe several efforts of the BID team. One story is with campus partnerships and a second story is with our Wisconsin Idea STEM Fellows program. The third story we share is the development of resource materials for developing effective partnerships from the perspective of both researchers and community members.

Partnerships are essential to most Broader Impacts activities. The UW-Madison campus has a vibrant, longstanding engagement and outreach community. Much of our commitment to these activities is embodied in the campus commitment to the Wisconsin Idea. The Wisconsin Idea was formulated and stated some 115 years ago by the then President of the University of Wisconsin. President Van Hise expressed that "I shall never be content until the beneficent influence of the University reaches every family of the state." We-faculty, staff, and students- are all committed to working individually and collectively to fulfill our commitment to the Wisconsin Idea. One nugget learned during the beginning of the BID project was that identifying the key touch points and individuals in the large system of the UW-Madison is key to amplification and sharing of the resources and increase the value that we can offer researchers.

One example of the cascading impact of the BID project is with our College of Engineering (CoE). We early on reached out to the research office in the CoE. We fortunately found receptive deans in that office who helped promote the BID project as a valuable and needed resource for engineers writing NSF grants. This support and in fact endorsement of the BID project led to many consultations and partnerships on NSF submissions. It also led to many engineering researchers participating in our Professional Development offerings whether it was our CAREER or GRFP workshops or our Wisconsin Idea STEM Fellows program.

Professional development is key to developing effective programming. The Wisconsin Idea STEM Fellows program offers guidance and support for staff, faculty, post-docs, and graduate students in learning how to develop effective activities to engage with the public. UW-Madison became a Portal to the Public institution prior to the BID grant. We did several Portal trainings of cohorts with several campus units participating in the offerings under the Wisconsin Idea STEM Fellows label. When the BID project was funded it took over the WI Idea STEM Fellows program.

The BID project offers about four cohort (up to 15 individuals) training workshops per year. We have now graduated over 200 participants. The two-four hour trainings are held two weeks apart and are held in the early evening. The curriculum consists of overviews of science communication, Broader Impact Identity (credit to Julie Risien, OSU), engaging the public, and time to develop outreach/engagement activities. It is ideally an ideation to develop pilot products for researchers at all stages of their careers. Participants commit to presenting at three public events in a year to fulfill their obligations to the program. All degrees of development of the pilot projects are shared at these events. Many do many more and continue well after their year is over.

Relationships, communication, and recognizing expertise. How have you worked to understand each other? When did you struggle or fail to understand one another? How did you navigate the culture and language code-switching necessary to work across organizations? How did you establish clarity around goals, timelines and roles? How did you build trust within the partnership?

5. California

As always, relationships and trust center somewhat around personalities and one cannot discount the fact that if partners cannot get along, communication systems or other efforts will

most likely not result in a good partnership. I think it was clear from the beginning, when Sharon and I met, that we have the same passion for the BID project and the importance of it. I think Sharon understood from the beginning that the Fleet does not only see BI partnerships as a way to secure funding and support existing programs, but that the Fleet values being able to help PIs succeed. That goes beyond submitting a successful grant and securing funding for the research, it also relates to the PI being able to make his/her science accessible to the public and to give learning opportunities in science communication to the whole lab. I think placing the same amount of value on Broader Impact, not as just another grant requirement, but seeing it as the important tool to engage a public that will ultimately be able to vote on and fund research, and in general be affected by the research in one way or another, as helped us build a strong relationship. We also found it very beneficial, especially at the beginning of the partnership, to have regular calls, as there is a learning curve for both organizations to better understand how the other works. From the beginning we were very open with each other and neither one of us was shy to ask questions about processes and how we might be able to improve them. We made sure that any phone or in person meeting were followed up with an email summarizing timelines and responsibilities. I served as the point person at the Fleet to move our team long to complete deliverables on time, while Sharon works with the PI to make sure milestones are hit in time.

6. Washington

Pre-existing relationships in the UWB-PSC partnership set the stage for the BID work. When the BID project began, Pacific Science Center already had established a years-long history working with UW Bothell researchers through its Portal to the Public program and through collaborations with UWB researchers working in science education (Carrie Tzou and her robotics backpacks program), environmental education (LWWIP), and chemistry education (Charity Lovitt working with Discovery Corps youth). These partnerships were initiated and maintained by the individual faculty members. The BID Co-PI at UWB decided to anchor the project in the UWB Office of Research (UWBOR) which serves faculty of all disciplines. Since all proposals are submitted through the Office of Research, the Co-PI there could recruit PIs throughout the university for the BID work. The UWB-PSC BID team members decided to offer PIs three services: 1) the opportunity for each PI to construct their personal BI Legacy Narrative, 2) the development of a BI menu for each PI, and 3) Portal to the Public training for each PI and their collaborators.

Building on the relationship between UWBOR staff and PSC staff, we constructed a generic menu of BI programs in which PIs could participate and which the BID team could customize to each PI's strengths and abilities. Because the BID team representative from PSC was also a Portal to the Public trainer, she was accustomed to understanding the context and constraints of university-based work and bridging that to ISI work. The UWB BID team representative had worked at PSC before coming to UWB, so she understood the context and constraints of museum-based work. This familiarity with one another's institutional contexts enhanced the trust that existed at the beginning of the BID project, catalyzed deeper shared understanding of how to work together with PIs, and sharpened the focus of the BI options and plans created with each PI. Taken together, the aforementioned affordances allowed the UWBOR-PSC duo to engage in more direct and unreserved conversations with PIs, taking into account the PI's abilities to interact with audiences and the support the BID team recommended writing into their proposals to optimize each PI's BI impact. Both members of the duo code-switched effectively with each PI, whether the PI was an inexperienced BI provider (Hung Cao) or an expert science communicator (Joey Key). The UWBOR-PSC pair learned, along with interested PIs, the Broader Impact Legacy Narrative protocol, which was delivered by its developer, Dr. Julie Risien. Again, their trusting

relationship allowed the two to absorb this new information and process individually, then talk about how best to use it to support PIs in their growth as researchers.

After three years of BID work, the BID tools on which the UWB-PSC partnership focused are embedded into Office of Research services that are offered not only to researchers submitting proposals to NSF, but to researchers submitting to other funders in both STEM and non-STEM disciplines. The menu of BI activities offered to UWB researchers by PSC has grown beyond what was developed at the beginning of the BID project and capitalizes on revenue-generating activities for both institutions (summer camps). This UWB-PSC menu of BI experiences has been tested over time and, through many instances of success interspersed with challenges which were addressed together, has come to be relied upon by multiple researchers, whether funded by NSF or not. This UWB-PSC partnership has become an exemplar for those faculty and staff who seek to develop other UWB community partnerships. It was highlighted in UWB's successful application for a Community Engagement Classification designation from the Carnegie Foundation and featured in UWB's Winter/Spring 2020 Magazine (<https://www.uwb.edu/getattachment/uw-bothell-magazine/archive/winter-spring-2020/UW-Bothell-Magazine-Winter-Spring-2020-Accessible.pdf?lang=en-US>). The pre-existing partnership between both institutions has been enhanced by the BID work and continues to provide growth opportunities for UWB researchers and PSC audiences.

7. Minnesota

Attending the BID training together at the outset of our efforts was critical. It enabled us to move quickly from never having actually met in person, to understanding each other's work and personal style and goals. It also facilitated our developing a shared vision and way of talking about our BID efforts. Following the initial BID training and meeting, we continued to meet regularly to set and follow action plans to address our vision. Because we are geographically dispersed across the state, our meetings typically happened on the phone or via video conference. Having a supportive university department head and committed faculty with relatively clear granting plans made the goals and timelines relatively easy. The conversation was also easy because we are all familiar with the university setting and ecological disciplines.

On the other hand, we had to work closely with and rely on each other to better understand and navigate the different mechanics and norms of our university and ISE organizations. During our meetings, we often discussed who best to contact and how best to navigate the "politics" in our different institutions. We learned that sometimes a good idea from one organizational vantage is less desirable from the other or unrealistic on the suggested timeline. We learned that sometimes Emily (ISE) could play a part in UMN events or connect with different people that may not have been accessible to Nate (university), or we could ask questions that stimulate useful conversations at our partner organization that may not happen organically.

Finally, we also co-organized and hosted a "get to know you" meeting of key Extension (university) and MN Zoo (ISE) staff. This was really helpful in fostering familiarity, trust, and communication more broadly beyond our working relationship.

8. Wisconsin

The Wisconsin BID team created a set of flexible guiding documents that mapped out a timeline, researcher and partner expectations, and helped to prompt considerations of the many facets of a quality broader impact plan such as building trust and making connections with community partners early on in the proposal preparation process. An early career assistant professor was

preparing her first NSF CAREER Award application and became aware of the Wisconsin BID team and solicited a meeting. At the first meeting the WI BID team staff worked collaboratively with the researcher with several BID tools. Working through the BID tool 'Impact Identity' helped the researcher align their broader impacts goals with their internal capacities and integrate with their research aims. As part of developing an understanding of the researcher's impact identity several community partner organizations emerged as good candidates that matched well with the researcher's desired impacts following the impact identity exercise. The next phase was truly exciting as another project idea developed for an NSF AISL proposal. The proposal was rich with partnerships; four community partner organizations, an evaluator, three UW-Madison research labs and one external research institute with lead roles, multiple research labs with minor contributions, and our public engagement with science programs at the Discovery Building providing an infrastructure for programming and reach of the proposed activities. After having gone through the NSF CAREER BID support process the researchers changed her practice and early on in the NSF AISL preparation phase hosted one of two early and inclusive meetings that brought together nearly all of the above listed partners on the project in planning and perspective session.

9. New York

Our work together began with a shared desire to build a functional and durable relationship, where each organization had equal footing at the table, and could therefore bring benefits to both organizations. We had a common goal of creating shared processes and structures that would not only be beneficial in terms of streamlining interactions and partnerships across our organizations, but to do so in ways that would be both nimble and sustainable for both organizations over the long-term. From the beginning, both organizations were able to envision some of the potential benefits to each organization, and we discovered additional benefits as we worked together. We were also able to anticipate some of the challenges that come with any partnership: the size, cultural and financial differences across our organizations are great, so issues of power, privilege, needs and capacity were likely to arise in our work together. Other challenges were impossible to anticipate: the complexity of personality differences, emergent project roles and responsibilities and staff change also challenged our partnership effectiveness at times. Having clearly articulated overarching goals gave us a strong foundation on which we could work through both the partnership opportunities and challenges. Regular communication, face-to-face interaction, shared work and shared decision making (empowerment) became the pillars for which trust and commitment developed across our team. In the early phase of our partnership, some project staff met daily, others weekly, and all of us came together monthly. Monthly meetings took place at both institutions, staff were provided orientation training at both institutions and had working days in the partners institutions as well. This allowed us to learn more about each other firsthand; our cultures, our strengths, our mandates, our stakeholders, timelines and competing responsibilities. For example, University researchers applying for NSF CAREER awards would reach out to the Sciencenter in early July for project development and letters of collaboration for mid July grant submissions. At the same time Sciencenter staff were busy beginning the start of their summer camps programs and had limited capacity to work with researchers in project development. Neither organization was aware of the deadlines and competing priorities of the others. This awareness allowed all of us to shift our timelines ahead, by months in fact. As the partnership insights deepened, we continued to establish and refine shared goals and processes to better foster our work together.

It took a year, and more, with dedicated staff engaged in deliberate and consistent communication, shared work, and ongoing interactions for our partnership work to become

embedded in the organizations in ways that moved the work beyond the individuals directly involved in the partnership work. We had built trust and open communication across our team through this work as well, and that became critical in our ability to work together and not abandon the partnership when various challenges arose. We had established enough trust and commitment to the partnership to address the issues and figure out together how to manage certain roadblocks. Team meetings became a safe and necessary place to negotiate power dynamics, individual partner needs, and new directions for the partnership work.

Power dynamics within the ecosystem. Where have you encountered, and how have you dealt with, power imbalances within the partnership? These may be related to money (e.g. to hire help, dedicate time, general resources, or from NSF), organizational size, privilege, and/or positionality (i.e., where one sits in an organization and the amount of authority and agency they feel they have as a result).

10. Colorado

We are fortunate to work on a campus with over 20 different broader impacts providers. Our partnership is between our campus's Research and Innovation Office, another large umbrella organization concerned with education and outreach, and one specific broader impacts provider. We were initially concerned that other BI providers would feel like we were doing something exclusive to them, since we hadn't included them in our application to the BID partnership. However, this concern that the BID partnership might cause tension among other groups in our large, complex "ecosystem" of on- and off-campus BI providers was not supported. When we came back from the initial planning meeting, we sent all BI providers on our campus a report of what we had accomplished, making sure we were being completely transparent. In the end, the BID collaboration has enabled us to make a stronger case for the importance of BI work overall and has led to deeper involvement of the three partner organizations as well as other BI providers on campus in endeavors like the "Commit to Submit" program for faculty preparing NSF CAREER proposals.

11. New York

Mission-driven organizations can feel bound to attempt every opportunity that might result in community engagement and betterment and bring in additional funding, but spreading ourselves too thin or spending resources on work that doesn't fit our mission or play to our strengths can leave us further from reaching our goals. Part of our early work on this project involved the creation and subsequent use of a tool we have called an Institution Self-Inventory. This tool gives institutions a chance to reflect on their strengths and goals, and to think critically about what kinds of work fit best within a strategic framework to continue advancing those specific goals, while taking advantage of their strengths and resources in the community.

Before the Sciencenter became involved in this grant, many of our interactions with researchers were fairly one-sided. Researchers would approach us with last-minute requests for letters of support for a grant due tomorrow (or sometimes, a grant that had already been submitted!). We would bend over backward to pull something together, only to find that the proposed work did not fit with our mission or current strategic plan, or that researcher had no intention of providing resources to implement the work.

With our self-inventory completed, and our mission top of mind, we were able to make sure that partnerships with researchers were actually collaborative. We met with researchers early and often whenever possible, to help build programs that could advance our current work or mission-based goals. As a small institution, we cannot possibly partner with every researcher in town; nor

would that lead to effective broader impacts work. The Institution Self-Inventory allowed us to actively pursue and build up partnerships that would be the most effective, and crucially, feel comfortable saying “no” when it was clear that a partnership would not be beneficial to our work.

Recently, we received an email from a researcher, requesting a letter of collaboration. We enthusiastically suggested a time to sit down together and develop a plan for effective broader impacts work to benefit both parties, to which the researcher sheepishly replied that they did not have time to meet as the grant was due the following day. And we, emboldened by our clear sense of our mission, politely wished them luck in this funding round, and invited them to reach out ahead of time if they would like to collaborate on developing their broader impacts for a future proposal. How liberating it can be to say no!

Durability. What indicators have you observed that the work is becoming institutionally embedded, through engagement of leadership, additional staff, succession planning, and new policies, procedures or routines that support sustained partnership? How have you navigated the balance between nurturing individual relationships with the desire to create systems/institutionalize? How has the team navigated the issues that arise from job changes and turnover?

12. Colorado

The National BID project fueled our 3-way partnership by first catalyzing a meeting with all of our respective supervisors that confirmed their high-level support as demonstrated by agreeing to promote our events, routinely inform faculty about the existence of our resources, etc. Having the stamp of approval on our work from the Vice Chancellor of Research and the Director of the Office of Outreach and Education for our campus lent authenticity to our work so that Department Chairs and even Deans were more likely to promote connections with their faculty. We have had a lot of broad participation at our campus BI Expo--a resource fair where faculty hear from and get to talk to BI providers across campus--and now that we have an in-person and virtual model for the Expo it seems sustainable annually. Last, our website for BI resources on campus gets heavy traffic throughout the year.

13. California

I think this is an issue we are still struggling with in both institutions. Both Sharon and I feel that, at this point, the effort is still tied to both her and I as a person. At the Fleet, we have not yet added BI responsibilities into my position description. And given the many other priorities I have, that seem to constantly be changing, it is still not clear if my position is the best to remain the point person for this initiative. While I know that the Fleet Leadership Team sees the BID as an important effort, and one that we would like to continue to grow, it will take more strategic planning on our end to make sure we can sustain these efforts. For example, for the foreseeable future, I will be taking on a co-workers education program as she is leaving, this will limit my available time even further to grow our BI support from UCSD to other higher ed institutions in San Diego. I have also not been able to really understand how to best work with UCSD outside of Sharon's office. Sharon's office, by necessity, is only working on large NSF grants and the NSF Early Career Grants. But I understand that there are many more NSF grants that fall into neither of these two categories that PIs at UCSD apply for. It has been difficult for me to understand the university structure. The different schools at UCSD seem to be very siloed and there is no other office, outside of Sharon's that works school overarching on small to medium NSF grants. In addition, it is very difficult to find out how each different school works with PIs on these grants

and what the best way for the Fleet would be to make PIs aware that the Fleet could be a great resource for them.

14. Washington

Staff turnover in both institutions has been a challenge for institutionalizing this work throughout the course of this project. With each change in leadership, the BID representatives chose to enroll the new decision maker in the BID work, as well as re-enroll that person's direct reports and peers. While it is obvious that new employees need to be introduced to the project and their support enlisted, the need to re-enlist the support of those who are already supportive is not so obvious. In both institutions, many of the PIs (IHE) and program managers (ISI) work independently of their peers and report to those who are new to the organization. The BID team felt it was necessary to gain and/or maintain the support of all the people in the BID participant's reporting chain in order to safeguard against project knowledge and experience being lost in future employee turnovers as well as to progress toward institutionalization of the work. The enrolling conversations with new employees are usually planned for that purpose, though they may be one agenda item among others in an introductory meeting. The re-enrolling conversations for those already participating in the BID work often occur in the course of commonplace interactions, rather than in meetings specifically devoted to that purpose.

During the last funded year of this project, the PSC representative changed roles within the institution and is no longer working on this project. She was not immediately replaced, and with the closure of PSC due to COVID-19, she will not be replaced before this funding period ends. The relationships between UWB employees and PSC employees that have been built and maintained before and during the funding period (see previous vignette) enable the BID work to continue during and hopefully after the COVID-19 disruption. In other words, the relationship capital has been adequately distributed within PSC. During the same timeframe, the UWB representative's hours have been reduced. She is able to continue the BID work at the current level during the final year of funding, though her continued level of effort beyond the funding period is still uncertain. She is working to maximize and further distribute the relationship capital within UWB so that the BID work is institutionalized in BOTH places independent of both BID representatives.

15. Minnesota

One of the keys to enabling us to move beyond the work being centralized on the two core BID members seemed to happen after we hosted a "get to know you" meeting where key Extension (university) and MN Zoo (ISE) staff were able to introduce themselves and learn about different projects that could possibly lend themselves to future partnership opportunities. After this meeting, staff from both the university and the ISE side have emailed directly to discuss areas of potential collaboration or partnership. Some staff have still chosen to first email the two BID leads, but, with encouragement, it seems more are now emailing the person from the other institution directly. This helps to foster sustainability by moving the bottleneck and focus on the initial two BID trained team members, to instead focus on the institutions as a whole and ways that we can continue to partner.

Of our three initial BID PIs, one of them seemed to have more focus and overall interest in working within the BID framework. Part of this has to do with the stage of the PI in the grant writing process, as well as the needs of them/their students. This particular PI just submitted a grant proposal, based on our work together, that includes broader impacts efforts from both of our Extension and MN Zoo programs. Based on the initiative and actual grant submission of this PI, it is likely that the PI will continue to engage both the university and ISE support throughout future

BID projects. Hopefully that PI will continue to find the process beneficial and useful, such that they will share the information with other PIs.

One area that we had discussed implementing, but have not yet, was offering a mini-workshop or training for new, incoming, or early-career faculty at the University. The idea for the training came from a supportive and engaged university department head. Implementing this type of training could further help us sustain the partnership and also work more toward institutionalizing the BID work beyond individual relationships.

Finally, we are still meeting/working periodically with all of our project PIs. Having this continued, even if periodic, check-in allows us to continue to nurture the relationships and learn about additional ways we may be able to better sustain our efforts moving forward.

16. New York

One of the key goals of this grant was promoting institutionalization of partnerships -- meaning building partnerships that are embedded and persistent at an institutional level, and not tied to the presence or absence of specific people at an institution. The museum/informal education field (and to a lesser extent non-tenured academia), often exhibits high staff turnover, an issue that is exacerbated in a small town like Ithaca.

Though this project was short term, our small team has experienced multiple dramatic job changes, both within the institution and externally. Michelle Kortenaar, the PI on this project, originally held the title of Director of Education. In the span of two years, she has transitioned jobs within the Sciencenter twice, first to VP of Strategic Development, and most recently to Executive Director.

In our experience, we found that this partnership needs a dedicated person involved in the program delivery to help with coordination of researchers' BI efforts. During the span of this project, the Sciencenter also experienced staff turnover in this role, with the original Education Program Coordinator leaving shortly after the first year. The new Education Program Coordinator, hired just over a year into the project, hit the ground running, but had a steep learning curve and tested the ability of this partnership to withstand turnover. Because we had funding and a commitment to this partnership, the institutions had incentive to prioritize partnership even through turmoil.

In fact, we found we were able to navigate these changes quite successfully, due to one key decision: we maintained regular meetings. The entire team, from both the HEI and the ISE, continued monthly in-person meetings, even when it seemed there wasn't anything new to discuss. The ISE side had weekly internal meetings, as well as weekly check-ins with the BI Manager at the HEI. And the HEI BI Manager and the ISE Program Coordinator, the positions with the most time dedicated to this project and to interfacing with researchers, met at least once per week but often more frequently to make sure we were all advancing work to the benefit of both institutions.

Adapting and thinking bigger. Under what circumstances (and in what ways) has the partnership decided to expand the scope of the work? Where have you adjusted or adapted to ensure the partnership work aligns with shifting organizational goals or capacity? How have you embraced reflective practice and in what ways has it supported adaptability?

17. New York

Even with consistent team meetings, goal setting and shared tasks and deliverables, we came to discover at the end of year one, and for some time after, that our ultimate vision for the two organization partnership was, and perhaps remains, somewhat divergent. This makes sense because our institutions each have unique missions, stakeholders and resources to carry these out. From that vantage point, we hit some roadblocks, and experienced standstill and frustration at times across our partnership. In hindsight, this seems to be connected with the fact that we implicitly had different overall outcomes in mind for how the partnership would benefit our individual institutions. The self-inventory discussion process was amiss in the beginning of our partnership formation, partly because we didn't have the specific tool, and partly because we assumed we were all on the same page because we shared and discussed a three year project timeline and narrative for the work. After a year and a half into the partnership we revisited the self-inventory tool, and began to discuss more openly how the aims and needs of the HEI partners were not on the table so to speak, and when they were, they were often viewed as beyond the scope of what we could do together, and in some ways the ISE partners perceived these interests as a threat to the two-organization partnership.

The HEI staff partners assumed from the beginning that the in-depth and intentional nature of the two-organization partnership was ultimately a learning testbed from which we would together create and assess new ways and means to form university-community partnerships more broadly, more efficiently and more sustainably. By working together we assumed that the collective learning could then be used by both parties to grow and implement new partnerships and that partnerships could be implemented in either direction. HEI staff could use tools and new structures to bring new community partners into the BID process, and ISE staff could do that same with relevant HEI partners, like Public Service Center, Office of Engagement, K-12 outreach and more.

From the beginning, there has always been a bit of a mismatch, of both size and mission, between the two organizations in our partnership. In 2019 Cornell's NSF research expenditures were \$115.5 million. The Sciencenter total annual expenditures were? , Certainly, it would be impossible for all of those researchers to partner with the Sciencenter for their broader impacts, and many would not be a good fit for broader impacts collaboration with the Sciencenter based on their own interests and experience.

The Cornell side of the team was eager to expand this model to additional partners, as they saw this as a great opportunity to serve more researchers and elevate broader impacts more widely, but the Sciencenter was a bit more hesitant. While it's true that we could not partner with every Cornell researcher seeking NSF funding, we were afraid of losing this funding source ourselves if researchers went elsewhere. Additionally, the Sciencenter is well-known to the community as a children's museum, but many may not know that we also provide programming for adults, middle school students, and rural communities. Without an incentive for the HEI to promote partnerships with the Sciencenter, we feared that fewer researchers would meet with us, fewer researchers would discover collaborative interests with us, and ultimately, fewer researchers would write us into grant proposals.

After much deliberation and negotiation, and learning a lot about the differing organizational timelines, needs and priorities, we came to trust that our two-organization partnership was robust and embedded enough into our processes, that we could begin to pilot opening up to a wider circle of partners. We decided together to bring in a small subset of community institutions

that would expand the range of Broader Impacts partnerships beyond the ISE setting. We invited Cornell Cooperative Extension, Ithaca Children's Garden, WSKG Public Media, the local community college, CollegeNow program for high school STEM teachers and two non-profit STEM organizations, Community Science Institute (Water Quality and Citizen Science) and Discover Cayuga Lake. We did this in partnership with the Cornell Public Service Center as well.

We brought everyone together for two days of workshop activities and discussion under the belief that "a rising tide lifts all boats." Going it alone, harboring and protecting what we had learned for the sole benefit of our single partnership would not foster the kind of sustainability to our work that a network or seasoned practitioners might provide. It was risky in a sense, to move away from competition and toward cooperation and expansion, especially when many small, non-profit organizations feel like they are competing for the same small pool of community funds. Our two-organization partnership came to grow together, through the growing pains and toward a larger vision for our work, where perhaps together, community organizations could band together, learn from one another, and form a unified front, and approach to supporting and shaping the Broader Impacts mandates and requests coming from the HEI community. We wondered, what might happen to the quality of BI work in our community, if all community partners advocated for their organizational interests, and needs, and were in positions where they felt empowered to ensure that appropriate resources would be allocated to them, for their contributions, involvement and expertise? Ultimately, our two-organization partnership grew through success and difficulty, and towards the creation and support of a network of partners where, we hope, might lead us to a better place where more HEI researchers and community organizations benefit from the formation of more deliberate Broader Impacts partnerships; where everyone speaks the language of BI and understands the drivers and opportunities within Broader Impacts partnerships, and enters into them on equitable footing and with sustainability in mind.

18. Wisconsin

The Wisconsin BID team built upon, expanded, and refined existing outreach and engagement programs and networks as well as forging new partnerships at UW-Madison. This vignette will describe several efforts of the BID team. One story is with campus partnerships and a second story is with our Wisconsin Idea STEM Fellows program. The third story we share is the development of resource materials for developing effective partnerships from the perspective of both researchers and community members.

Partnerships are essential to most Broader Impacts activities. The UW-Madison campus has a vibrant, longstanding engagement and outreach community. Much of our commitment to these activities is embodied in the campus commitment to the Wisconsin Idea. The Wisconsin Idea was formulated and stated some 115 years ago by the then President of the University of Wisconsin. President Van Hise expressed that "I shall never be content until the beneficent influence of the University reaches every family of the state." We—faculty, staff, and students—are all committed to working individually and collectively to fulfill our commitment to the Wisconsin Idea. One nugget learned during the beginning of the BID project was that identifying the key touch points and individuals in the large system of the UW-Madison is key to amplification and sharing of the resources and increase the value that we can offer researchers.

One example of the cascading impact of the BID project is with our College of Engineering (CoE). We early on reached out to the research office in the CoE. We fortunately found receptive deans in that office who helped promote the BID project as a valuable and needed resource for

engineers writing NSF grants. This support and in fact endorsement of the BID project led to many consultations and partnerships on NSF submissions. It also led to many engineering researchers participating in our Professional Development offerings whether it was our CAREER or GRFP workshops or our Wisconsin Idea STEM Fellows program.

Professional development is key to developing effective programming. The Wisconsin Idea STEM Fellows program offers guidance and support for staff, faculty, post-docs, and graduate students in learning how to develop effective activities to engage with the public. UW-Madison became a Portal to the Public institution prior to the BID grant. We did several Portal trainings of cohorts with several campus units participating in the offerings under the Wisconsin Idea STEM Fellows label. When the BID project was funded it took over the WI Idea STEM Fellows program.

The BID project offers about four cohort (up to 15 individuals) training workshops per year. We have now graduated over 200 participants. The two-four hour trainings are held two weeks apart and are held in the early evening. The curriculum consists of overviews of science communication, Broader Impact Identity (credit to Julie Risien, OSU), engaging the public, and time to develop outreach/engagement activities. It is ideally an ideation to develop pilot products for researchers at all stages of their careers. Participants commit to presenting at three public events in a year to fulfill their obligations to the program. All degrees of development of the pilot projects are shared at these events. Many do many more and continue well after their year is over.

The Wisconsin BID team created a set of flexible guiding documents that mapped out a timeline, researcher and partner expectations, and helped to prompt considerations of the many facets of a quality broader impact plan such as building trust and making connections with community partners early on in the proposal preparation process. An early career assistant professor was preparing her first NSF CAREER Award application and became aware of the Wisconsin BID team and solicited a meeting. At the first meeting the WI BID team staff worked collaboratively with the researcher with several BID tools. Working through the BID tool 'Impact Identity' helped the researcher align their broader impacts goals with their internal capacities and integrate with their research aims. As part of developing an understanding of the researcher's impact identity several community partner organizations emerged as good candidates that matched well with the researcher's desired impacts following the impact identity exercise. The next phase was truly exciting as another project idea developed for an NSF AISL proposal. The proposal was rich with partnerships; four community partner organizations, an evaluator, three UW-Madison research labs and one external research institute with lead roles, multiple research labs with minor contributions, and our public engagement with science programs at the Discovery Building providing an infrastructure for programming and reach of the proposed activities. After having gone through the NSF CAREER BID support process the researcher changed her practice and early on in the NSF AISL preparation phase hosted one of two early and inclusive meetings that brought together nearly all of the above listed partners on the project in planning and perspective session.