

GOODMAN RESEARCH GROUP, INC.
Program Evaluation • Consultation • Market Research

*Climate and Urban
Systems Partnership*
**Phase 2: Year 5
Evaluation Report**

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CHAPTER 1: INTRODUCTION

Since September 2012, Goodman Research Group, Inc. (GRG) has been working with The Franklin Institute on the evaluation of *Climate and Urban Systems Partnership (CUSP)*, a five-year Phase II CCEP project awarded to The Franklin Institute by the National Science Foundation Climate Change Education (CCE) program. Prior to the current grant, GRG evaluated the Franklin Institute's Phase I grant: *Urban Climate Education Partnership (UCEP)*.

CUSP CCEP

The CUSP program convened comprehensive networks of community organizations in four cities (Philadelphia, Pittsburgh, New York, and Washington, D.C.) to educate urban audiences about climate science and the urban impacts of climate change. These networks of climate-education focused organizations were intended to deliver a multi-platform, targeted, coordinated forum of climate change education programs with significant impact on urban populations' understanding of and engagement with climate change. The four platforms, as originally outlined in the Phase II proposal, included:

- **Physical Community Platform (Philadelphia):** Target specific neighborhoods and deliver repeated, coordinated learning opportunities to residents, exposing them to a cohesive set of messages that aim to reinforce key climate science concepts.
- **Temporal Community Platform (Pittsburgh):** Produce a library of festival booth activity kits that Urban Learning Network (ULN) organizations will use to expose festival-goers to climate change messages with a goal of attendees building mental models of how climate impacts city systems.
- **Virtual Community Platform (New York):** Leverage existing digital presence of CUSP partners to create a digital map with a series of coordinated messages to help digital audiences make connections between climate change and city system issues.
- **Community of Practice Platform (Washington, D.C.):** Support the other three platforms through a network of ULN member organizations working together to improve climate education practices.

Initially, CUSP outlined a structured approach of yearly hand-offs of particular platforms from one city to the next throughout the course of the five-year project. At the Year 2 in-person partnership meeting, partners agreed to shift to an approach that was more fluid, based on learning from their progress to date. Each city integrated the various platforms on an as-needed or as-ready basis, taking what they learned from the city that first developed that platform, then modifying and tailoring it to meet the needs of their own city, local network partners, and community residents. In the years that followed, partners continually cited their appreciation for that shift, reflecting on it as an improvement to the program overall.

GRG'S EVALUATION OF THE CUSP PROGRAM

GRG conducted an external evaluation of the CUSP Program in order to:

- 1) Monitor and evaluate the core CUSP partnership to assess partners' vision for the network, including the purpose of the network, strategies and tasks, leadership and decision-making, and the interpersonal dynamics and communication channels within the partnership, and
- 2) Document and assess the activities of the local Urban Learning Networks (ULN) created in the four cities with a focus on:
 - a. Clarity of and agreement with goals of the network among all members,
 - b. Structure and functioning of the organizations within the network and how those change over time,
 - c. Implementation of network activities in each city, and
 - d. Integration and execution of programming across all four cities and corresponding impact on the communities.

CUSP aimed to develop and cultivate local networks of interdisciplinary organizations to deliver climate change education programs and provide opportunities for city residents to explore climate science, and to change urban populations' understanding of and engagement with climate change issues.

This document provides an overview report of data relevant to CUSP's overall goals over five project years as well as a summary of Year 5 evaluation activities and findings.

GRG conducted the following evaluation activities during the fifth year of CUSP Phase II:

Throughout:	<ul style="list-style-type: none"> ▪ Participated in the partnership’s regular monthly CUSP team phone meetings, as well as periodic meetings with each hub team. ▪ Maintained ongoing dialogue with project team about research and evaluation plans. ▪ Entered retrospective data from each city’s quarterly reports throughout the year into online tracking form (CUSP Activities Form).
September 2016	<ul style="list-style-type: none"> ▪ Submitted Quarterly Evaluation Report to the CUSP project team.
October 2016 & March 2017	<ul style="list-style-type: none"> ▪ Participated in Climate Hangout webinars and collected online follow-up survey data.
November 2016	<ul style="list-style-type: none"> ▪ Submitted Quarterly Evaluation Report to the CUSP project team. ▪ Provided Philadelphia with city-specific data from the CUSP Activities Form.
December 2016	<ul style="list-style-type: none"> ▪ Submitted CUSP Year 4 Evaluation Report.
February 2017	<ul style="list-style-type: none"> ▪ Conducted phone interviews with the four core partner teams to hear their perspective on the evolution and story of their local networks. ▪ Provided Philadelphia with city-specific data from the CUSP Activities Form.
March 2017	<ul style="list-style-type: none"> ▪ Submitted Quarterly Evaluation Report to the CUSP project team; facilitated de-brief conversation with core partners on findings regarding the evolution of local CUSP networks in each city. ▪ Created ULN animated video for the NSF STEM for All Video Showcase.
April 2017	<ul style="list-style-type: none"> ▪ Visited Philadelphia and observed the 2017 Philadelphia Science Carnival. Assisted in administering intercept surveys to attendees; entered and reported on survey data.
May 2017	<ul style="list-style-type: none"> ▪ Launched follow-up survey to 18 attendees of the 2017 Philadelphia Science Carnival. ▪ Developed classification schema for ULN partner organizations; shared with city conveners, requesting that they code each organization accordingly. ▪ Launched the fifth Annual Core Partners Survey to 17 partners; received 100% response.
May - July, 2017	<ul style="list-style-type: none"> ▪ Consulted with Pittsburgh via email and phone on evaluation activities for the Homewood Summer Team Program.
June 2017	<ul style="list-style-type: none"> ▪ Submitted Quarterly Evaluation Report to the CUSP project team and contributed evaluation-related information for inclusion in the project’s annual report to NSF. ▪ Launched 5th Annual ULN Survey to 260 partners; 42% response rate.
July - August, 2017	<ul style="list-style-type: none"> ▪ Conducted data analysis for Annual Core Partners and Annual ULN surveys, including social network analysis and growth of ULN network. ▪ Prepared final summative evaluation report.

All surveys, annotated with full data, are in Appendix A.

CHAPTER 2: CUSP CORE PARTNERSHIP LEVEL FINDINGS

Throughout earlier project years, GRG researchers facilitated regular phone conversations with the lead partner(s) in each CUSP city approximately every four months to record the evolution of the four local networks. Conversations were guided by a common set of questions about the functioning of their city's network, along with a focus on changes they noticed over time.

In addition, each year since CUSP's inception, GRG collected a list of their local members and organizations from the four city leaders. Beyond using the contact information for the Annual ULN Survey, GRG tracked the growth of each city's local network throughout the five years. In February 2017, GRG conducted phone interviews with city network leaders specifically to discuss their perceptions of their local network's evolution since the beginning of CUSP Phase II. Interviews were designed to contextualize the information collected as we created graphics to depict evaluation of ULNs' size and function throughout the project. These results are presented in the Local Partner Level Findings, beginning on page 15.

In May 2017, GRG administered the final annual online survey to the 17 core CUSP partners (i.e., those who participate in the bi-weekly electronic updates, monthly phone calls, and in-person meetings). Similar to prior years, the Year 5 Annual Core Partners Survey addressed partners' perception of and satisfaction with CUSP to date, and included a section of questions to be used for social network analyses (SNA). The following section presents these survey findings.

CORE PARTNERSHIP KEY ACCOMPLISHMENTS

In Year 5, a majority of partners reported that interacting, sharing, and working together across cities has been the primary accomplishment of the partnership to date. Examples of such work included:

- Developing a video for the NSF STEM For All Video Showcase that was pulled together very *"quickly and smoothly,"*
- Jointly facilitating a workshop at ASTC, with plans to conduct another longer workshop next year,
- Sharing ideas and strategies for communicating within each CUSP community, and
- Helping other core partners select city-specific mini-grant recipients.

Other accomplishments mentioned by a few core partners included the decision to expand CUSP messaging beyond urban audiences, and the related decision to sustain the model and continue collaborating with one another after the grant period ends. Representative quotes follow.

"We collaborated on the STEM for All video, and the way the team was able to define and narrow the presentation was a testament to how we have internalized the learning research, educational approach and partnership mechanisms."

"The pulling together of the video production in fairly short order showed a lot of trust among the team."

"I love how the site managers worked together to develop and lead the CUSP workshop at ASTC. In my experience over the years, it's rare to see a peer group so willing to share credit

and work together for the good of the whole. It embodies how genuinely open and trusting we have become through our implementation of the model.”

“I think we were successful at creating these resources because we had spent so much time working together already.”

Overall, CUSP core partners expressed appreciation for how much they have learned together as a partnership group, *“internalized the CUSP model,”* and come to trust one another as colleagues. As expressed by one partner: *“Every presentation by a member of the core team is representative of the group’s thinking and work. “*

EFFECTIVE PARTNERSHIP: GAP ANALYSIS

The strategic partnership and alliance literature highlights a number of characteristics essential to an effective partnership. Each year, in the Core Partners Survey, we have listed several characteristics as indicators of success of the collaboration. Partners rated each item first for its importance to them, and then for their satisfaction with the extent to which the item has been achieved through the CUSP partnership. Both importance and satisfaction were rated on a 5-point scale from 1 (*Not at all*) to 5 (*Quite a bit*).

To identify priority areas for improvement, GRG conducted gap analysis: Mean satisfaction scores were subtracted from mean importance scores. If the mean “gap” score of an item is positive, above zero, this indicates that respondents feel the item is very important, but they are not fully satisfied with the extent to which it has been achieved. In this instance, some action may be required or recommended. If the gap is negative, below zero, this indicates overachievement; respondents feel this attribute is relatively unimportant, but are very satisfied with it, and resources may be better spent on another aspect of the work. **The closer the gap is to zero, the better balance there is between importance and satisfaction.**

In Year 5, as in prior years, partners’ gap scores were all fairly close to zero, revealing **an appropriate balance between the value they place on an item and their satisfaction with that item.** For a few items that showed room for growth (i.e., positive gap scores) in earlier project years, there has been a shift in perception over time and items have since moved to the other side (i.e., negative gap score), indicating that no further action was required by Year 5.

Notably, three items that had warranted attention in prior years, including *improving expertise in an area outside your field*, *engaging in productive discourse with partners*, and *knowing what your partners are working on*, have since shifted either to ideally balanced or to less important (and more satisfied). These shifts coincide with partners’ perceptions of significant accomplishments in Year 5; they interacted more frequently and in meaningful ways that reflected a collaborative and trusting partnership. Appendix A shows the complete, detailed ratings of importance and satisfaction, and the gap scores, for Year 5. Exhibit 1 depicts only items with room for improvement based on ratings each year. The one item that remained in Year 5, *developing new tools, concepts, data, methods, or results to share with the public*, reflects the partners’ belief in the value of the CUSP model and their interest in sustaining the collaborative work beyond the life of the grant.

Exhibit 1. Items with Room for Improvement: Years 2-5

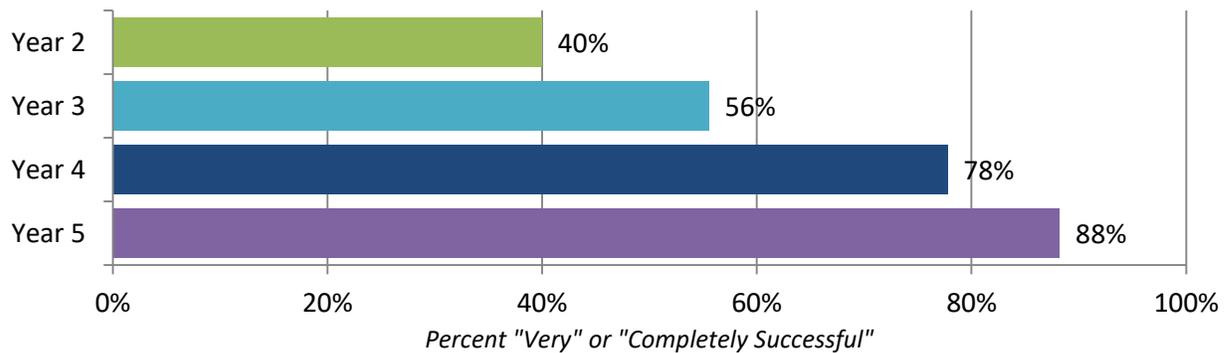
Elements	Year 2	Year 3	Year 4	Year 5
Engaging in productive discourse with your partners.	*	*	*	
Developing new tools, concepts, data, methods, or results to share with the public.	*	*	*	*
Knowing what your partners are working on.	*	*		
Feeling encouraged by the project co-PIs to build strong team relationships with partners.	*			
Feeling that your partners understand your perspective.	*	*		
Being able to rely on your core CUSP partners.	*			
Improving your own expertise in an area outside of your work/field.	*		*	
Coordinating with other partners on joint activities.	*		*	
Having opportunities to work on interesting tasks that stretch your knowledge and capabilities.		*	*	

N=17-19

CORE PARTNERS' PERCEIVED ATTAINMENT OF PROJECT GOALS

On average over the years, partners perceived the CUSP partnership as increasingly successful at reaching overall goals (i.e., develop and cultivate local networks of interdisciplinary organizations and provide opportunities for city residents to explore climate science). Analyses were conducted over time, including only those partners who have been CUSP core partners since Year 2 (N=13). Ratings on a scale from 1 (*Not successful*) to 5 (*Completely successful*) revealed significant increases between Year 2 and Year 5. Exhibit 2 shows the proportion of partners who selected the top two points on the scale (“very” or “completely successful”) in Years 2-5.

Exhibit 2. Partners' Perception of Success of the CUSP Partnership to Date



N=13

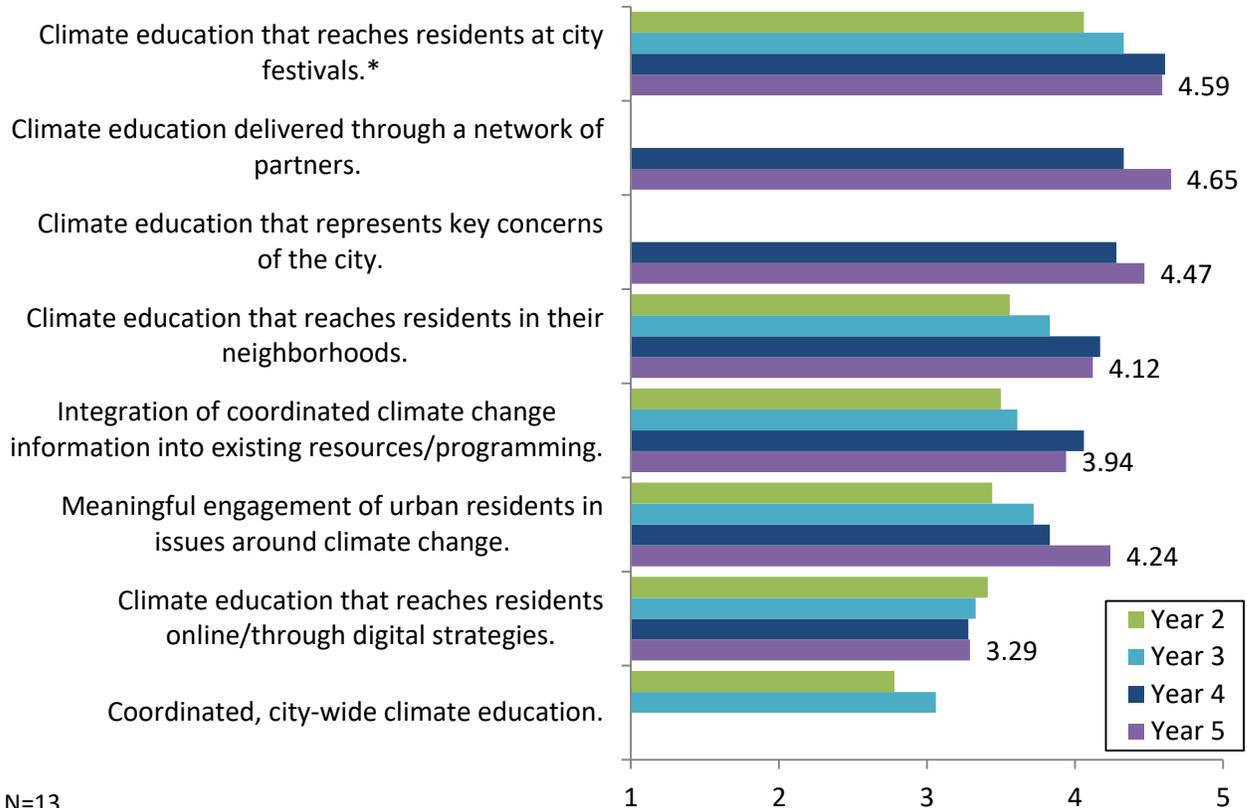
Scale: 1 (*Not successful*) to 5 (*Completely successful*)

Year 2 Mean=3.20, Year 3 Mean=3.56, Year 4 Mean=3.78, Year 5 Mean=4.06.

Partners also continued to feel increasingly confident that project objectives would ultimately be met. Average ratings for several objectives increased moderately between Year 2 and Year 5. There were significant increases in partners' confidence that *climate education will reach residents at city festivals*. Shown in Exhibit 3 below are three additional items that showed increases in confidence in Year 5:

- Meaningful engagement of urban residents in issues around climate change
- Climate education delivered through a network of partners
- Climate education that represents key concerns of the city

Exhibit 3. Core Partners' Confidence that CUSP's Objectives will Ultimately be Achieved



N=13

Scale: 1 (Not at all confident) to 5 (Extremely confident)

*Statistically significant difference ($p < 0.05$) between Year 2 and Year 5

CORE PARTNERS' PERCEIVED BENEFITS

Consistently since Year 2, nearly all partners have considered the *new connections made with a range of institutions and colleagues to whom they can turn for ongoing collaboration, research, and teaching*, as primary **professional benefits** attributable to their CUSP participation. More than half also noted *increased confidence related to explaining concepts outside of their own area of expertise and turning to others outside of their field for information*. In Year 5, a benefit selected by more partners than in prior years was *increased ability to solve problems using knowledge gained from other partners*. A few partners also wrote in their own perceived benefits, primarily related to the enhanced connections that have provided new context for their own work. These factors coincide with the earlier comments about partners working more interactively during this past year. See Exhibit 4.

Exhibit 4. Professional Benefits Experienced as a Result of Participation in CUSP

	# of partners*			
	Y2 (N=15)	Y3 (N=18)	Y4 (N=18)	Y5 (N=17)
Connections with a greater diversity of institutions	18	17	18	17
New colleagues to turn to for ongoing collaboration, research, and teaching	13	15	15	17
Increased ability to solve problems using knowledge gained from partners	9	10	13	15
Confidence to turn to others outside of your own field for ideas and information	11	12	12	14
Confidence to explain to others concepts outside of your work/field	12	12	13	15
Increased satisfaction with working relationships in your own institution/organization	5	6	10	14
Increased recognition as an expert in your own field	8	11	14	12
Direct praise from institutional leaders for your participation in this interdisciplinary partnership	3	7	5	11
Enhanced performance at work	5	5	10	10
More likely to take risks related to teaching, research, seeking funding, etc.	3	7	6	9

Note: Green shading highlights the top three most common benefits experienced each year.

Over the years, nearly all core partners attributed professional benefits to the ongoing collaboration that occurred throughout the course of the project. In addition to *exposure to literature outside their area of expertise*, in Year 5, 100% of the partners also cited *exposure to learning frameworks outside their expertise*. Each year, a couple of partners have commented, in their own words, about various other factors responsible for the benefits they have experienced. In Year 5, comments focused on learning from their local network (ULN) partners during public events. See Exhibit 5.

Exhibit 5. Factors that Contribute to the Professional Benefits Experienced

	# of partners*			
	Y2 (N=18)	Y3 (N=17)	Y4 (N=18)	Y5 (N=17)
Exposure to learning frameworks outside my typical area of expertise	10	10	12	17
Collaborating with colleagues outside my field	15	14	13	16
Exposure to literature outside my typical area of expertise	11	14	13	14
Working closely with colleagues within my field, outside my department or institution	11	13	12	13

Note: Green shading highlights the top two most common factors that contributed to benefits experienced each year.

In Year 5, approximately half of the core partners continued to report zero professional frustrations attributable to their participation in CUSP. Very few partners selected any of the options listed (see Exhibit 6), although one partner wrote in a frustration about the “*lack of peer reviewed publications at this stage in the project.*”

Exhibit 6. Professional Frustrations Experienced as a Result of CUSP Participation

	# of partners*			
	Y2 (N=15)	Y3 (N=17)	Y4 (N=18)	Y5 (N=17)
None of these	7	7	8	9
Lack of institutional appreciation for involvement in the project	4	5	6	4
Deadlines for this project that interfere with other work	4	2	1	4
Confusion stemming from different fields' professional jargon	1	2	0	2
Distraction from other professional activities	9	2	2	1

Note: Green shading highlights the top two most common selections each year.

Similar to the professional benefits, top **personal benefits** reported by the core partners related to *learning what can be accomplished through interdisciplinary collaboration* and their own *increased enthusiasm for sharing quality information with the public*. In Years 3, 4, and 5, nearly all partners cited *increased feelings of camaraderie* as a personal benefit resulting from their CUSP participation. After doubling from Year 2 to Year 4, the number of partners citing *increased satisfaction with their own current work and research* increased again in Year 5. In their own words, partners in Year 5 described greater appreciation for bringing diverse populations of people together and helping one another reach the public in creative ways. See Exhibit 7.

Exhibit 7. Personal benefits experienced as a result of participation in CUSP

	# of partners*			
	Y2 (N=13)	Y3 (N=18)	Y4 (N=18)	Y5 (N=16)
Enhanced beliefs about what interdisciplinary collaboration can accomplish	10	11	14	16
Increased feelings of camaraderie	9	16	16	14
Increased enthusiasm about sharing quality information with the public	11	12	14	14
Increased appreciation for climate science	9	12	13	14
Increased satisfaction with my own current work and research	5	7	11	14

Note: Green shading highlights the top two most common personal benefits experienced each year.

Consistently over time, partners reported very few personal frustrations attributable to CUSP participation; like professional frustrations, most said they have experienced none. However, during Year 5 there was a slight increase in the number of partners citing *their own institutional regulations and policies* as a frustration. One partner explained further that the frustration was related to contracts and limitations placed on the mini-grants. See Exhibit 8.

Exhibit 8. Personal frustrations experienced as a result of participation in CUSP

	# of partners*			
	Y2 (N=14)	Y3 (N=15)	Y4 (N=18)	Y5 (N=17)
None of these	4	5	10	8
My own institutional regulations and policies	4	4	3	6
Insufficient face to face interaction	5	6	5	5
Tight deadlines for reporting	3	2	0	1
Insufficient travel support	0	0	0	0

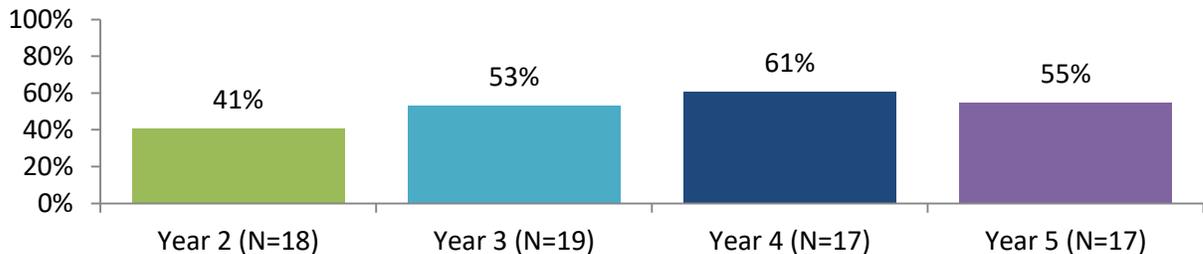
Note: Green shading highlights the top two most common personal frustrations experienced each year.

CORE PARTNERS' SOCIAL NETWORK ANALYSIS

Social Network Analysis (SNA) maps illustrate informal relationships between partners in a collaborative network. Since Year 2, the Annual Core Partners survey asked partners to indicate with whom they collaborated outside of the regular bi-weekly calls, how often those collaborations occurred, and the purpose of these collaborations. In Year 5, for the first time, network density declined from the prior year to the current year. Network density is a measure of the number of connections or collaborations that occurred in relation to the number of potential connections (PC¹) possible, given the size of the network. Among the 17 partners, there was potential for 272 connections, 149 of which occurred in Year 5 (Exhibit 9).

Density correlates with effectiveness of the networks: the more people know each other, the more likely they are to collaborate and be more productive.² Despite the slightly lower network density in Year 5 compared to Year 4, it was still greater than that during Years 2 and 3. Furthermore, more than half of all potential collaborations were realized, which points to maintenance of a healthy network.

Exhibit 9. CUSP Network Density: Years 2-5



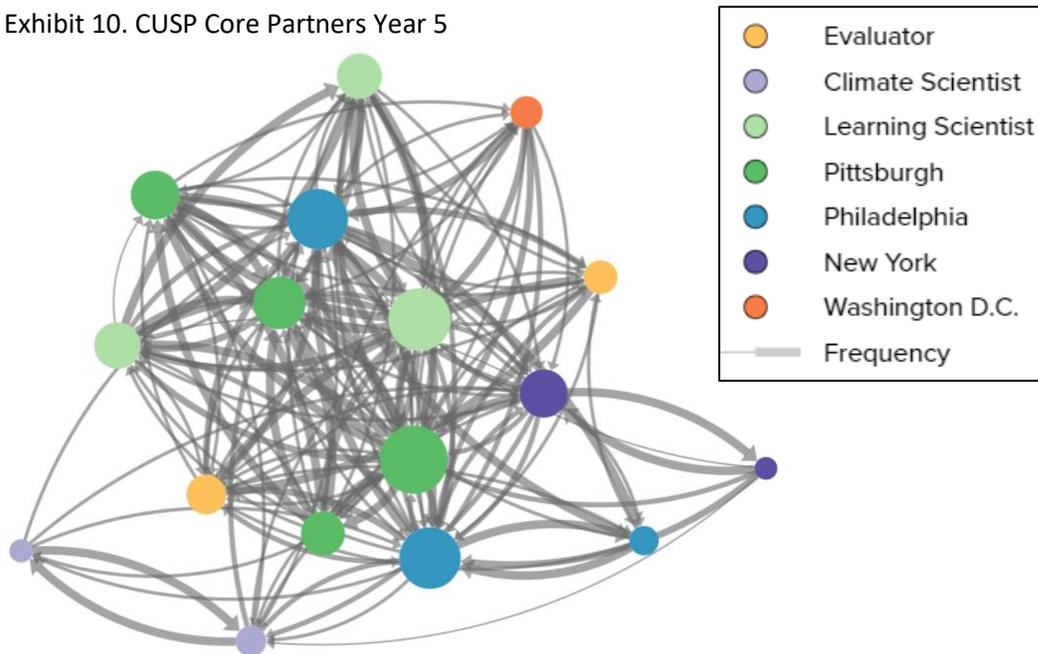
In Exhibit 10, each node (circle) represents one of the CUSP core partners. Each individual node is color coded according to their role as a partner in one of the four cities: a learning scientist, a climate scientist, or an evaluator. As in the prior year, the CUSP core partner network consisted of 17 members when the Year 5 survey was administered: three Philadelphia Partners, four Pittsburgh partners, two New York partners, and one DC partner, as well as three learning scientists (in Pittsburgh), two climate scientists (in New York), and two evaluators (in Boston). The lines connecting each node represent a reported interaction between two partners. The width of the connecting line represents frequency of collaboration³; the thinnest lines represent collaboration *a few times a year* while the thickest lines represent collaboration *once a week or more*. Between two partners, there may be a minimum of zero connections and a maximum of two connections (bi-directional). Collaboration direction is represented by a small gray arrow at the end of the connection. In Exhibit 10, the size of the node correlates with the strength and number of connections associated with any one core partner.

¹ The number of PC is calculated as follows, where each partner represents a node (n); $PC = n*(n-1)$.

² Anklam, P. (2007). *Net work: A practical guide to creating and sustaining networks at work in the world*. Burlington, MA: Elsevier.

³ Scale 1 to 5: only at CUSP in-person meetings or infrequently, a few times a year, once a month, a few times a month, or once a week or more.

Exhibit 10. CUSP Core Partners Year 5



Connections specifically between learning scientists and climate scientists were minimal and did not increase over time. Core partners agreed that climate scientists were connected **adequately** through both sharing city-specific updates with network conveners and Climate Hangout webinars. This collaboration pattern has remained relatively constant throughout the partnership. See Appendix B for images of these connections in Years 2 through 5.

HIGH-LEVEL NETWORK OBSERVATIONS

Year 5 network density declined compared to Year 4, but was still greater than Years 2 and 3. On average, core partners collaborated with 7 partners in Year 2 and 9 partners in Years 3-5. The average frequency (collaboration strength) was greatest in Year 2, followed by Year 5.

During Year 5, New York and Pittsburgh partners became increasingly central to the network, and Washington D.C. continued to develop stronger and more numerous connections. Climate Scientists, Evaluators, and Learning Scientists (to some degree), remain on the network periphery; this observation is not problematic because these individuals have maintained strong and sufficient connections with the select core partners described further below.

SNA analyses yield four notable metrics that help to conceptualize network functioning in Years 2-5. Exhibit 11 explains those metrics and how they relate to the CUSP partnership. Graphics and a summary of each metric can be found in Appendix B.

Exhibit 11. CUSP’s Social Network Analysis Metrics

Metric	Network Role	Noteworthy Partners
Degree centrality	Connectors and hubs	The primary connectors throughout the partnership were the core partners in Philadelphia and Pittsburgh, and a learning scientist in Pittsburgh.
Betweenness centrality	Information brokers	The primary information brokers throughout the course of the partnership were the core partners from Philadelphia, Pittsburgh, and New York.
Indegree connections	Key influencers	The key influencer throughout the partnership was a learning scientist in Pittsburgh.
Reach Efficiency	Friend-of-a-friend connectors	Historically, the key individuals who connect through other core partners are the climate scientists and evaluators.

Note: “Throughout the partnership” refers to Year 2-5, as partners did not complete the Annual Core Partner Survey in Year 1.

FREQUENT NETWORK COLLABORATION

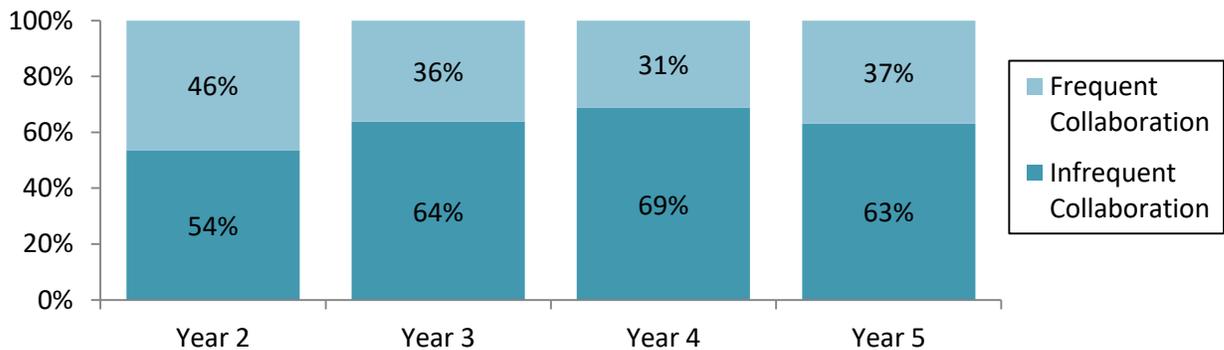
The CUSP core network is highly interconnected and relies on collaboration between partners of varied frequency. Exhibit 12 displays the prevalence of frequent collaboration (strong connections) and infrequent collaboration (weaker connections) over time. In this context, frequent collaboration is defined as collaboration between two partners a few times per month or once a week or more.

On average over the past four years, 37% of all collaborations between partners have been frequent (strong connections) while 63% have been infrequent (weaker connections).

Interestingly, frequent collaboration was more prevalent during the second and final year of the partnerships, and lowest in the penultimate year.

While there is no single "correct" network style, different structures are more or less conducive to different kinds of work. Generally, weak network ties are sufficient for simple knowledge transfer, and strong ties are necessary for complex knowledge transfer. Thus, it makes sense that more frequent collaboration occurred during the start and end of the project, while partners’ interactions centered on early project start-up and later actual implementation of multiple programs and resources. During the middle years, interactions were steady, and less frequent collaboration sufficed.

Exhibit 12. CUSP Core Partners’ Frequent⁷ Collaboration (Strong Connections)



Year 2 N=18; Year 3 N=19; Year 4 N=17; Year 5 N=17

As shown in Exhibit 13a-d, partners frequently collaborated with those in similar roles or physical geography, which can be observed in the grouping of nodes by color. For example, Pittsburgh and the Learning Scientists create a fabric of connections, particularly in Year 2. Similarly, the Climate Scientists are connected to the larger group through New York, who serves as the connector to Pittsburgh and the Learning Scientists.

Additionally, the frequent connections remain highly stable over the four years:

- Starting in Year 3, the D.C. city convener collaborated frequently with a learning scientist.
- The New York city convener collaborated frequently with the Pittsburgh and Philadelphia city conveners, and communicated with the learning and climate scientists.
- The evaluators were in frequent collaboration with the Philadelphia city convener, which makes sense given that person's role as the project lead.

Exhibit 13a. CUSP Core Partners Year 2

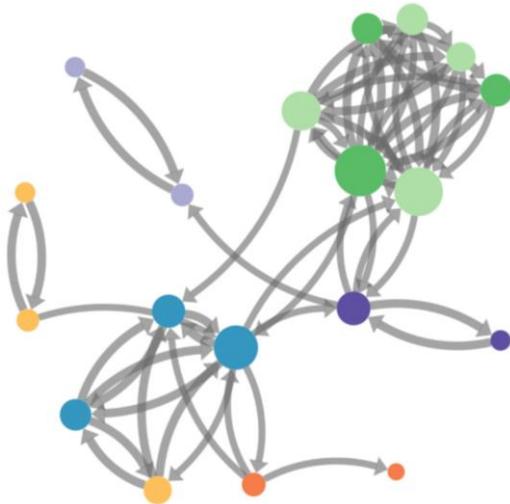


Exhibit 13b. CUSP Core Partners Year 3

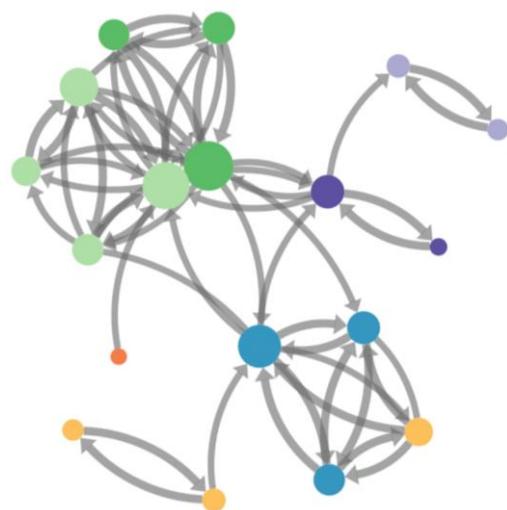


Exhibit 13c. CUSP Core Partners Year 4

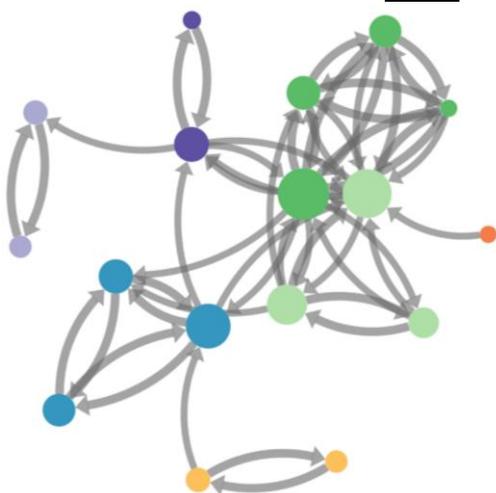
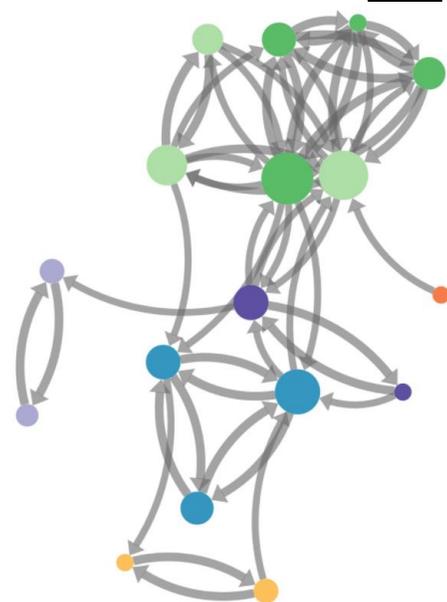


Exhibit 13d. CUSP Core Partners Year 5



ADDITIONAL YEAR 5 COLLABORATION DETAILS

Among the core partnership, collaboration among partners (outside of the monthly calls and bi-weekly updates) ranged from four to 13 reported connections per partner. During Year 5, similar to Year 4, partners who reported collaborating with one another did so approximately *once a month* on average. Nearly all partners reported receiving *just the right amount* or *more than enough* support from their CUSP colleagues. Of all collaborations reported, only 6% report *needing more support* from a specific partner with whom they collaborated.

Across the group, 100% of partners collaborated with at least one other partner *to regularly exchange information or resources*, and 100% of partners reported at least one CUSP partner has *connected them to helpful others*. Nearly all partners (88%) reported being *inspired* by one or more partners. Furthermore, all (100%) reported having *worked with CUSP partners on joint initiatives outside of CUSP*. The way partners describe their collaboration suggests a healthy and functioning partnership. Through the final year of the partnership, CUSP seems to embody three general characteristics that have been identified as indicators of high-quality work in an interdisciplinary partnership: consistency, balance in terms of weaving together different perspectives into a clear whole, and effectiveness in teams working so as to advance a common goal (Mansilla & Gardner, 2003)⁴.

⁴ Mansilla and Gardner, “Assessing Interdisciplinary Work at the Frontier: An empirical exploration of ‘symptoms of quality’”, 2003.

CHAPTER 3: LOCAL PARTNER LEVEL FINDINGS

CUSP “ASK A CLIMATE SCIENTIST” WEBINARS

Throughout the project, CUSP Climate Scientists Daniel Bader and Radley Horton hosted seasonal “Ask a Climate Scientist” webinars, attracting between 15-20 attendees per event. Each webinar began with a presentation of relevant information (e.g., description and explanation for the observed winter temperatures in CUSP’s four cities) and concluded with a question and answer discussion with participants. In collaboration with CUSP leadership, GRG developed a post-webinar online evaluation survey for those who attended the event(s). As shown in Exhibit 14, after five events, ten surveys were completed by attendees.

Exhibit 14. Post-Webinar Evaluation Surveys

Webinar	Number of Respondents
March 2016	1
May 2016	3
July 2016	4
October 2016	2
March 2017	0

N=10

Attendees who responded rated the webinars favorably; half rated the event as *very good* or *excellent*. Two-thirds felt the webinars were either *very* or *extremely effective* at meeting the primary objective:

Climate scientists will identify current climate change impacts and create products that capture key elements of climate impacts and adaptation that are relevant to urban areas and are easy for project partners to use in their communities.

Nine of 10 respondents report having made connections to local researchers, urban planners, and/or decision makers in urban centers due to their participation in CUSP. Nearly all connections were facilitated by their local CUSP city convener, and two additional people reported that the CUSP Climate Scientists themselves assisted with introductions.

Webinar attendees felt that connections to local researchers were helpful for facilitating information and resource sharing and networking for future projects and research. Additionally, attendees cited the access to scientists from Bader and Radley’s group to be helpful for acquiring accurate technical expertise on climate change issues.

CREATION OF LOCAL “ULN”S

Composition of CUSP ULN Partner Organizations

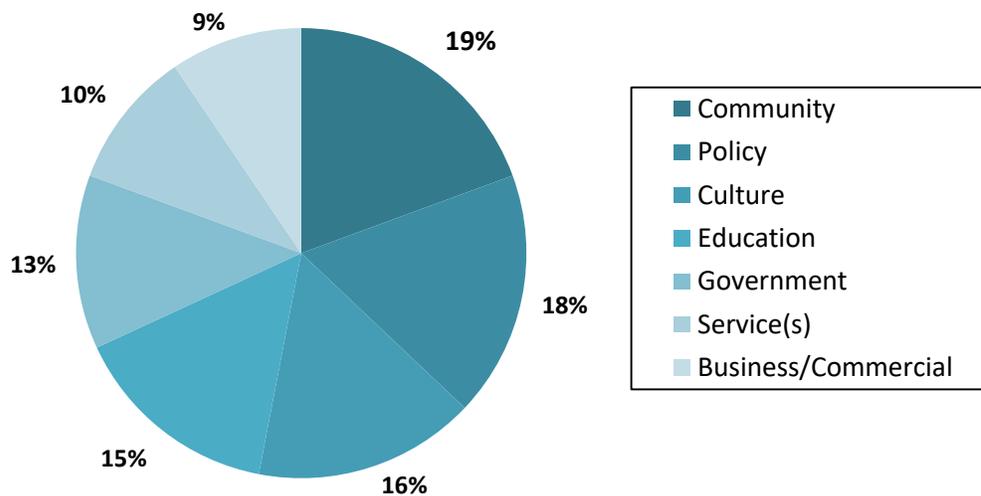
Before administering the Annual ULN Survey (described further below), GRG asked each city convener to review their past and present partner ULN organizations and categorize each based on their stated mission/purpose. The categories were as follows:

- Business/Commercial

- Community (e.g., church, neighborhood programs, out-of-school time programs)
- Culture (e.g., museums)
- Education (e.g., elementary, secondary, higher)
- Government (e.g., federal, local, parks/recreation)
- Policy (e.g., civic, advisory, and philanthropy)
- Services (e.g., energy, health, transportation, infrastructure)

As shown in Exhibit 15, across all four cities, nearly one-fifth of CUSP partner organizations have a community-focused mission and one-fifth are policy driven. The next most common are cultural and education-related organizations. About one in ten are affiliated with local or state government or services. Businesses are the least common CUSP affiliates across the four cities.

Exhibit 15. ULN Network Organizations (Past and Present) by Type



N=232

**Note: Includes all organizations (past and present) from Year 1-5, with the exception of DC, where only organizations from Year 3-5 are presented.*

Across the four CUSP cities, there were no significant differences in the prevalence of different organization types. However, there were a few interesting differences:

- Philadelphia has the largest percentage of Community and Policy organizations of the four cities.
- The majority (78%) of service organizations (Energy, Health, Transportation, Infrastructure) are affiliated with Pittsburgh.
- New York had the largest percentage of cultural organizations of the four cities.
- D.C. had a particularly high number of organizations falling under the umbrellas of education and government.

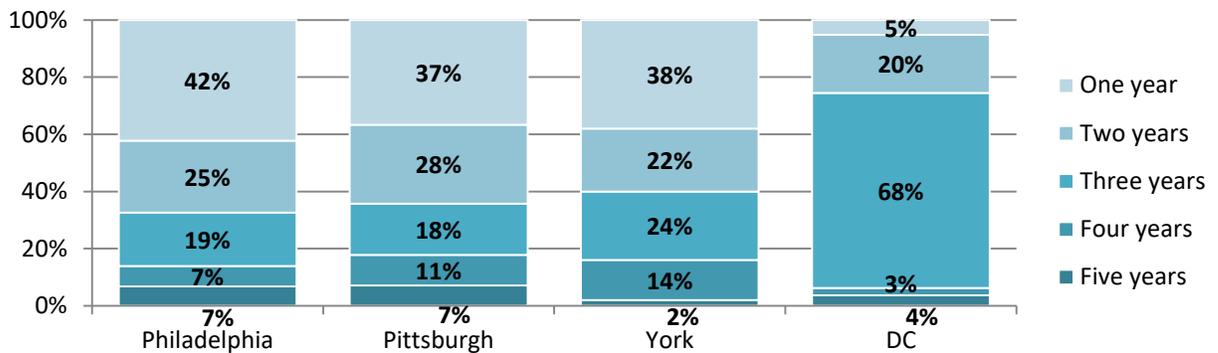
Evolution of Local CUSP Networks

Over the past four years, CUSP ULN conveners have taken different approaches to recruiting and developing their local networks. Exhibit 16 shows that these approaches may have influenced the duration of ULN member participation. Across the four cities, 5% of the current members

have been involved with CUSP for all five years, and 7% have been members for four years. The majority of members have been involved for three years (35%), two years (24%) or one year (29%).

Membership duration appears similar across the Philadelphia, Pittsburgh, and New York networks. Changes in D.C. CUSP leadership led to a different pattern due, in part, to uncertainty about the participation level of all partners over the years. Year 1 began with a very large number of potential partners; this was followed by a change in the hosting informal learning center and city leader and, later, another change in the city leader. A large number of partners who had likely stopped participating in CUSP after Year 1 were officially declared “inactive” at the end of Year 3, allowing the new city convener to rebuild the network through his own connections.

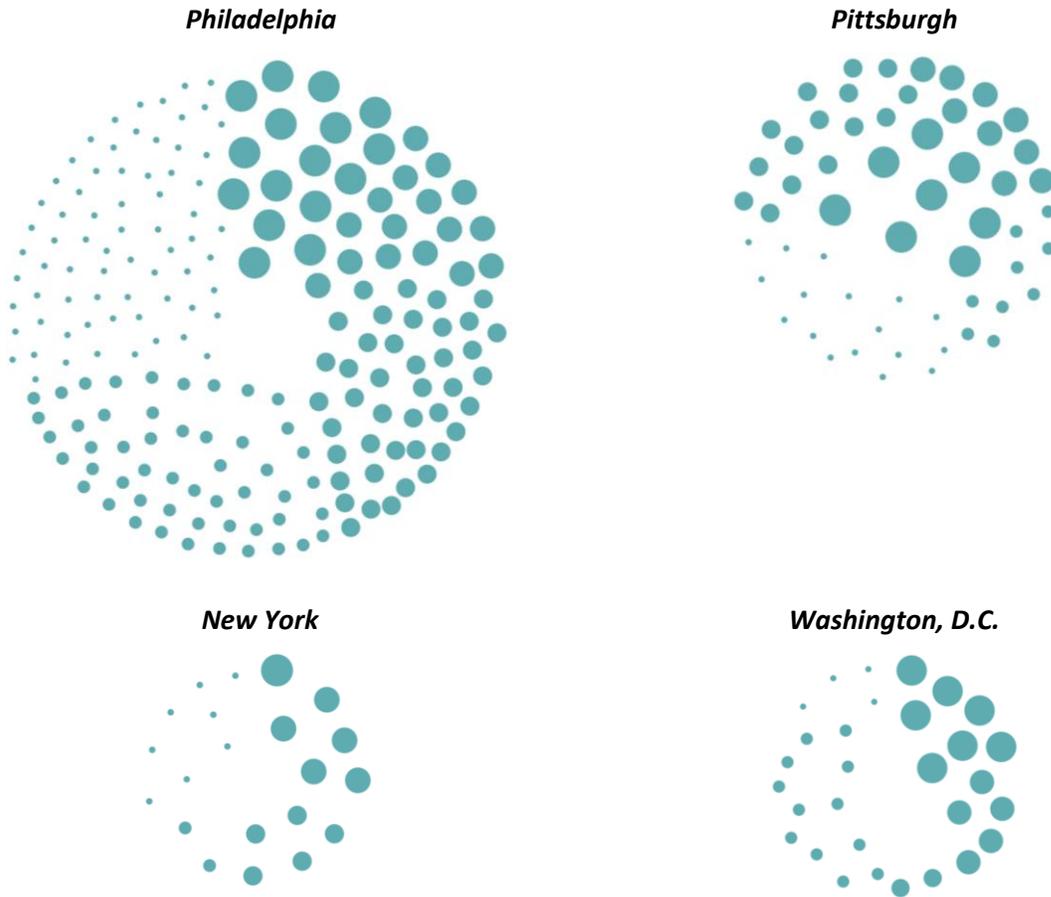
Exhibit 16. Duration of ULN Partner Membership (Past and Present) by City



Philadelphia N=251; Pittsburgh N=112; New York N=50; Washington, D.C. N=192

Exhibit 17 depicts active local partners in each CUSP city in Year 5 of the partnership. Each individual ULN partner is depicted by a node (circle), with size scaled by the number of years they have remained an active CUSP member (i.e., largest nodes have been CUSP ULN members for five years, smallest nodes have been CUSP ULN members for one year). Philadelphia has the largest network, followed by Pittsburgh, Washington D.C., and New York. All cities have at least one local partner who has been affiliated with CUSP for the full partnership duration (Year 5).

Exhibit 17. City Local Partners in Year 5



Note: Only depicts current members in Year 5 (inactive, or past members, are not represented).
Philadelphia N=251; Pittsburgh N=112; New York N=50; Washington, D.C. N=192

CUSP core partners have had a broader impact in their communities than represented above, considering additional past local partners who are not represented visually in Exhibit 17. Through the evolution of CUSP local partnerships and development of individual core partner networks, CUSP has engaged 604 local partners (across 337 organizations), 304 of whom are still involved. **This is notable: 50% of all local partners recruited have maintained continuous involvement with CUSP.** For whatever reason local partners are no longer involved (e.g., lack of institutional support, career changes, etc.), CUSP city conveners have communicated CUSP's primary mission and goals to a sizeable audience. Ideally, these individuals continue to carry forward this knowledge into future professional and personal environments.

YEAR 5 ANNUAL ULN SURVEY

In June 2017, GRG modified the Annual ULN Survey with updated activities and items provided by each city's network leaders and launched the fifth and final annual online survey to all CUSP local partners in July. As in prior years, the survey was designed to collect feedback about member experiences during the prior CUSP implementation year. By the end of July 2017, the survey was

specific event. Other common responses were related to mini-grants, social/community experiences, and sharing information with others about climate change. Commonly used words included “event” “great,” “organization,” and “workshop.”

Partners in Year 5 used greater detail to describe personal benefits they experienced, including their own learning and connections made with other organizations, as well as the positive impacts they observed due to having presented and shared information about climate change.

“The climate and health workshop hosted by the Franklin Institute was a really terrific event. Met lots of people there and learned a ton from the speaker!”

“My organization partnered up with the Philadelphia Climate Works this year through CUSP and are now assisting them with a mini grant that they received through CUSP. It is an incredibly valuable relationship that has been created through this network.”

“Representatives from CUSP and teachers who use CUSP resources presented to a large group of informal educators for a professional group called EEAC. It was a great way to share how CUSP supports both formal and informal education.”

“I borrowed CUSP activities to present at a girls’ STEM day in a different part of the city. It was a wonderful way to get the girls to think about the characteristics of their neighborhood and about climate change generally. There were a few that were clearly passionate; most had only the vaguest idea of what climate change meant. Good thinking opportunity for them.”

Every year to date, local CUSP partners indicated at least some involvement in their city’s specific CUSP-related activity. In Year 5, partners continued to make new contacts both within and outside of their city’s local network.

As has been the case since Year 1, local CUSP partners noted their ongoing involvement in CUSP activities throughout the fifth project year. Even in the final year, partners continued to introduce and suggest new contacts to CUSP in their city. They also continued making contacts within the existing network in their city and incorporating the CUSP approach into their programs, services and messaging to the public. Additionally, partners read and appreciated online newsletters (e.g., the *Climate Matters* newsletter, New York CUSP’s monthly newsletter), and continued to borrow kits to use at festivals. Partners rated the activities as quite valuable to their work, with average ratings between 4 and 5 on a scale from 1 (*Not at all valuable*) to 5 (*Extremely valuable*). Appendix A shows the CUSP-related activities in which local partners participated in Year 5. Participation in CUSP activity has grown over time, suggesting increased and sustained commitment to the project.

In Year 5, partners in all four cities used CUSP kits, mainly with youth and families at festivals and other out-of-school settings. Through visual demonstrations, they used the kits to engage participants and share information about climate change using the CUSP model and made valuable personal connections.

Throughout Year 5, 44% of local partners used one or more CUSP kits⁶; on average, respondents in Pittsburgh and New York utilized CUSP kits with the greatest frequency (one Pittsburgh partner reported using eight kits throughout the year). Among those who had not used a kit, most said they had not had the right opportunity (39%), or the resources did not fit into their work (33%). Relative to Year 4, fewer partners said they did not know about the kits. A handful of partners across the cities described specific plans to use kits in the future.

More than half of those who used a kit during Year 5 used it at festivals (61%), with youth (65%), and with families (52%); close to half used kits with adult learners (46%). Slightly fewer used the kits in out-of-school settings (35%). Nearly all used the kits to *engage participants* and *demonstrate concepts visually*, and the majority used the kits to *start conversations about climate change*, *connect climate change to participants' daily lives*, and *generally raise awareness*.

In Year 5, local partners valued the connections developed through mini-grant projects. The projects have helped them focus more clearly on climate change messaging and broaden their reach in the community as they raise awareness and understanding of climate change among their intended audiences.

In Year 5, 44% of local partner respondents had received a CUSP mini-grant, an increase from 27% in Year 3 and 36% in Year 4. Each city has funding set aside to award these small grants to local partners, who apply individually or with another organization to design and implement a CUSP-related activity. Partners reported that mini-grants, which built on both new and existing programming, positively impacted their own work and that of their organizations by *developing and strengthening partnerships* and *focusing more on climate change messaging*. They also reported *increased awareness and understanding of climate change* among the intended audiences. Together, organizations were able to increase their reach and provide members of the community with knowledge they could relate to and tools to utilize in the future. In particular, communal benefits included providing students with STEM-related skills to use in their future careers, offering educators curriculum resources *“to teach about local impacts of climate change and how to create solutions,”* and generally empowering community members to *“take action.”*

“The children involved in the community park summer activity received enriched activities and understand our connection to the environment more.”

“Attendees walked away with an abundance of info and physical giveaway materials.”

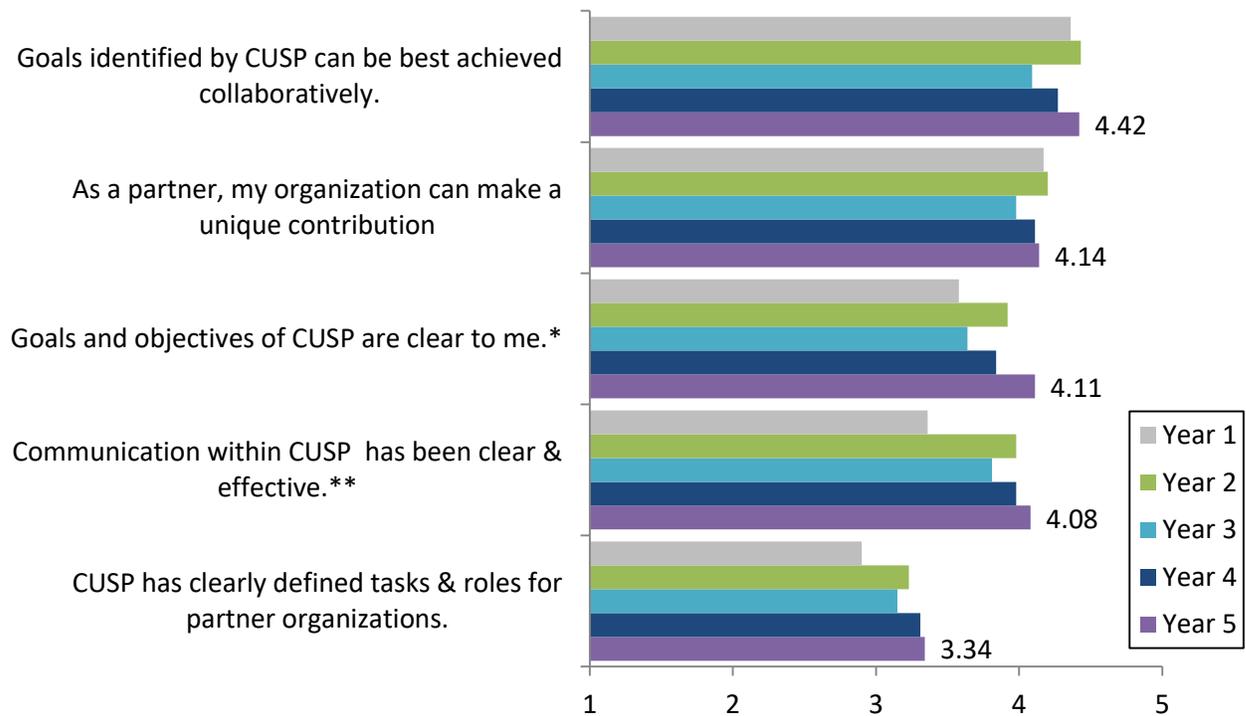
Since Year 1, local partners have demonstrated growing understanding of the network in terms of its composition, purpose, and clarity of communication.

Throughout the course of the CUSP project, local partners across the four cities agreed that the goals identified by CUSP *can best be achieved collaboratively*, and that their *organization can make a unique contribution* to the project. Each year, including Year 5, respondents reported slight

⁶ Recall: Temporal Community Platform (Pittsburgh): Will produce a library of festival booth activity kits that ULN organizations will use to expose festival-goers to climate change messages with a goal of attendees building mental models of how climate impacts city systems.

increases in their clarity around communication overall and specific to CUSP goals, objectives, and partners' related roles and responsibilities. See Exhibit 19 for overall ratings across cities. Looking at ratings across the cities, participants in D.C. rated two items lower than those in the other cities. Due to the lower number of respondents in D.C., GRG does not believe these differences are concerning; rather, the ratings reflect that D.C. partners have been involved with CUSP for less time and may still be working to understand the project model and goals more fully.

Exhibit 19. Partners' Agreement with CUSP Project Clarity: Years 1-5



Year 1 N=59; Year 2 N=60; Year 3 N=88; Year 4 N=100; Year 5 N=106

Scale: 1 (Strongly Disagree) to 5 (Strongly Agree)

*Significant differences ($p < 0.05$) between respondents in DC and respondents in both PHIL and PGH.

**Significant differences ($p < 0.05$) between respondents in DC and respondents in all other CUSP cities.

Compared to Year 4, local partners in Year 5 shifted slightly closer to the city conveners' ideal for their networks on two of the four collaboration measures.

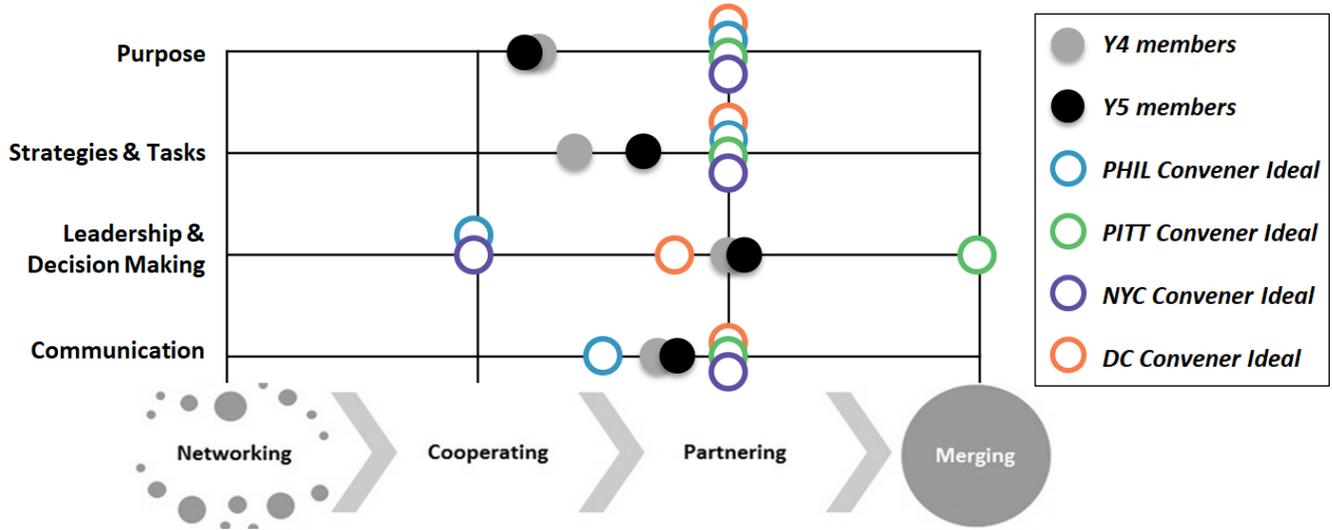
As mentioned in prior reports, the CUSP ULN assessment of network collaboration was based on the Strategic Alliance Formative Assessment Rubric (SAFAR).⁷ The rubric represents multiple levels of integration for four primary areas described extensively in the literature on strategic alliance development: *Purpose, Strategies and Tasks, Leadership & Decision Making, and Communication*. In both Years 4 and 5, local members were presented with a list of descriptions that characterized various levels of network integration for each collaboration area (see Appendix C). On the survey, respondents reviewed descriptions and selected the levels that most aligned with their own perception of the local network. In Year 4, GRG interviewed the network leaders in each city to learn

⁷ Gajda, R. (2004). *Utilizing Collaboration Theory to Evaluate Strategic Alliances*. American Journal of Collaboration. Retrieved from DOI: 10.1177/109821400402500105

their perceptions of the *ideal* position for their network on each of the four collaboration areas. Network leaders agreed that the ideal level of collaboration may vary by city (i.e., a more advanced level of ULN integration is not necessarily optimal for all cities) and that local members may not currently function at their ideal level.

Exhibit 20 shows where Year 4 and 5 local partners perceived the position of their network to be in each of the four areas (gray and black solid circles) along with network conveners' ideal position in those same areas (open circles). Local partners' ratings for Year 4 and Year 5 are presented in the aggregate because there were minimal differences between the four CUSP cities. For all areas except *Leadership & Decision Making*, conveners across the four cities predominantly perceive *Partnering* as the ideal level of collaboration. In two areas, *Strategies & Tasks* and *Communication*, local partners progressed marginally from Year 4 to Year 5 and are now slightly closer to the ideal level of collaboration identified by conveners.

Exhibit 20. Network Partners' Positions Relative to Conveners' Ideal Level of Collaboration



Year 4 Members N=69-91, Year 5 Members N=107-108

In their own words, respondents described the common goals for their city's CUSP network, as they perceived them. Across cities, nearly two-thirds referred to engaging and educating both community residents and members of the local organizations involved in the project. Close to half described collaborating and network building across local organizations as the common goals, and about one-quarter each mentioned sharing programs, products and resources and the solutions-focused nature of the messaging. Representative quotes follow.

"I think the most evident goal is to provide the means and opportunity to directly communicate with the public."

"CUSP is a formal network of organizations working together to educate about climate change."

“Providing informal education about local climate change mitigation strategies; giving local organizations tools and resources to provide education; and growing partnerships between organizations to further educational opportunities within neighborhoods.”

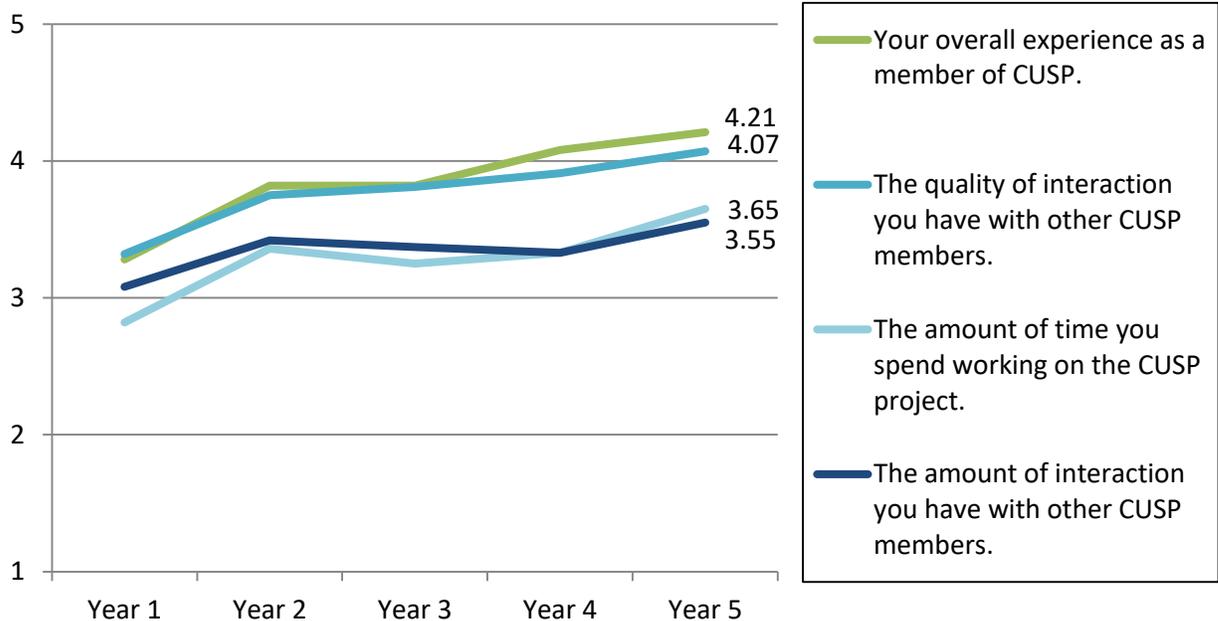
“To share the works of each individual group with an interested community and use the network as a community resource for support, questions.”

“To form new partnerships, to help the city and its citizens achieve a common goal of resilience.”

Local partners’ satisfaction with their experiences as a CUSP member increased each year of the project and was strong in Year 5.

Since Year 1, local partners have expressed growing satisfaction with their CUSP experience. Across all five years, relative to the other elements, partners reported high satisfaction with their overall experience and with the *quality* of interactions with others. See Exhibit 21. From Year 4 to Year 5, ratings showed a shift such that local partners were slightly more satisfied with the *amount of time* they spent working on CUSP and less so with *amount of interaction* they have had with other members. This suggests that the time they spent working jointly at events and on mini-grant projects (recall 44% received mini-grants in Year 5) was valued and led them to wish for even more time to work together. While D.C. had fewer respondents than other cities, it is notable that their satisfaction with the *quality of their interactions* with other members and their *overall CUSP experience* were quite strong, relative to partners in the other three cities; this is the reverse of the data last year, which showed lower ratings on those items for the D.C. respondents. Year 5 findings suggest that despite the lower numbers, local partners in D.C. are highly committed to and invested in the CUSP model.

Exhibit 21. Local Partners’ Satisfaction with CUSP Experiences: Years 1-5



Year 1 N=50; Year 2 N=60 ; Year 3 N=84; Year 4 N=97-99; Year 5 N=104-107
 Scale: 1 (Not at all satisfied) to 5 (Extremely Satisfied)

At the end of the fifth project year, local partners continue to identify several positive personal outcomes of their CUSP experience.

Each year, local partners rated their agreement with several potential outcomes of CUSP participation (personal, professional, and organizational) on a scale from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Examination of ratings for the full set of items revealed that respondents, on average, showed a great deal of consistency in their ratings (Cronbach’s alpha = .90). Each year, partners’ ratings were consistent, supporting stability in how partners perceive the effects of their participation in CUSP. The average score across all items was 4.09 out of 5.00, reflecting an increase from 3.95 in Year 4.

Exhibit 22 shows average ratings for the top ten outcomes each year; shading shows items with average ratings of 4.00 or higher (“*agree*” to “*strongly agree*”) on the five-point scale. Each year, participants’ ratings increased, such that in Year 5, the top ten potential outcomes were all greater than 4.00 out of 5.00, on average. Notably, local partners felt more confident about the benefits of the CUSP model, including working together and communicating with consistent language about the basics of climate change. They expressed interest in continuing to work together, as they recognize the value of informal education for their constituents and they feel comfortable working in their own environments to connect with others and share the CUSP message. Ratings for every item listed on the survey can be found in Appendix A.

In Year 5, slight differences between cities were revealed for two items:

- Philadelphia partners agreed slightly more than did those in D.C. that they were now able to *locate resources to learn more about climate change issues related to their specific region.*
- Pittsburgh partners agreed slightly more than did those in Philadelphia that they are now *better equipped than they were before CUSP to use systems language when talking about climate change.*

Exhibit 22. Agreement with Outcomes of CUSP after Implementation: Years 1-5

	Y1	Y2	Y3	Y4	Y5
I can communicate using consistent language about the basics of climate change, climate impacts, mitigation, and adaptation.	3.61	4.03	3.90	4.29	4.48
I believe that a coordinated approach to education has more impact than individual efforts.	--	--	--	4.00	4.48
I am interested in collaborating with members of this network on future projects beyond CUSP.	4.33	4.42	4.25	4.47	4.44
I recognize the impact informal education can have on city wide learning.	4.09	4.30	4.07	4.30	4.43
I am aware of climate impacts, mitigation, and adaptation specific to my city.	3.80	4.13	4.01	4.31	4.35
I perceive museums as organizations interested in sharing their resources in creative ways to meet shared goals.	4.13	4.37	4.10	4.22	4.28
CUSP has helped me to build a stronger connection to other organizations in the community.	--	--	--	--	4.27
I can communicate in a consistent way about how much work connects to climate change.	4.00	4.40	4.13	4.12	4.22
I have new tools and strategies for communicating the science of climate change in a way that is relevant to my	3.30	3.92	3.81	3.98	4.21

audience/communicating change related issues related to o my specific region					
I can locate resources to learn more about climate issues related to my specific region.	3.85	4.07	4.07	4.26	4.18
I have gained new knowledge about climate science.	--	--	--	--	4.18
I believe that sharing a large theme message has more impact than individual efforts.	4.08	4.50	4.36	--	--

Year 1 N=54; Year 2 N=60; Year 3 N=89; Year 4 N=101; Year 5 N=105

Scale: 1 (Strongly disagree) to 5 (Strongly agree)

Looking beyond the CUSP grant, the majority of local partners across all four cities reported they plan to continue ongoing collaborations they already have with local CUSP partners. Three-quarters noted they already have been, and will likely continue to be, involved with similar new projects in the future. Similar to the end of Year 4, partners were less certain about whether they would submit new grant proposals with their local partners; 47% were not sure whether such activity would occur.

Local partners’ perceptions that CUSP has been reaching its overall goals increased steadily through Year 5.

On average, after the fifth year of implementation, partners believe the CUSP network has been *successful* at reaching its goals to date, more so than in prior years. In Year 5, the average rating was 3.40 on a scale of (Not successful) to 5 (Completely successful). As noted at the end of Year 4, it is important to reiterate that **not all partners who complete the annual ULN survey are the same each year, and still there continues to be an increase in the perceived success to date.**

Respondents who rated the project as successful commonly cited the collaboration among partners and the opportunities to engage and educate the community. Exhibit 23 shows the perceived success each year.

“Wonderful collaboration among CUSP partners has made our work a great success.”

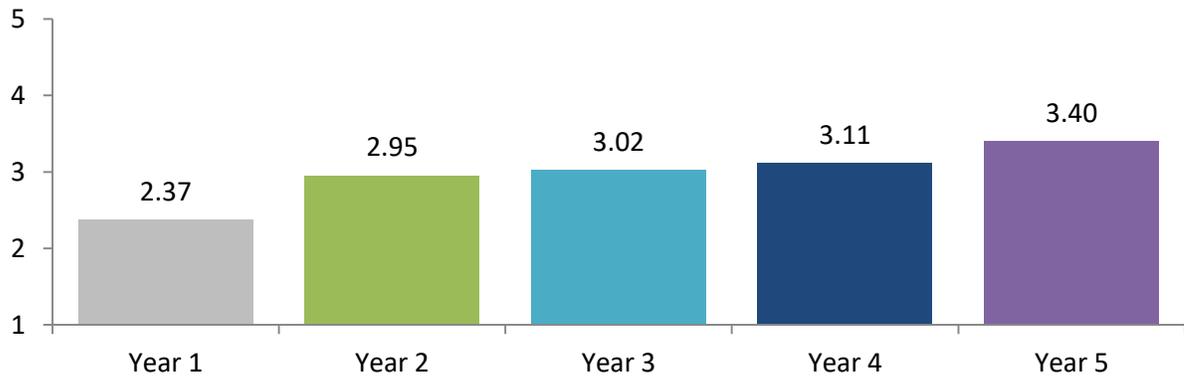
“Enhanced collaboration in a sometimes competitive advocacy environment.”

“CUSP has created a very strong network in Pittsburgh and created many original, useful teaching tools. I think the network members are well-prepared and I believe community residents have been positively impacted.”

“Excellent community outreach and inclusion, strong system of communication, high-quality educational materials, welcoming and collaborative atmosphere.”

“The CUSP Climate City projects reach into local communities on a consistent basis, which in turn fosters familiarity/increased awareness/perceived sustainability both across the network and within neighborhoods.”

Exhibit 23. Perceived Success with Overall Project Goals to Date in Years 1-5



Year 1 N=35; Year 2 N=43; Year 3 N=59; Year 4 N=76; Year 5 N=77

Scale: 1 (Not at all successful) to 5 (Completely successful)

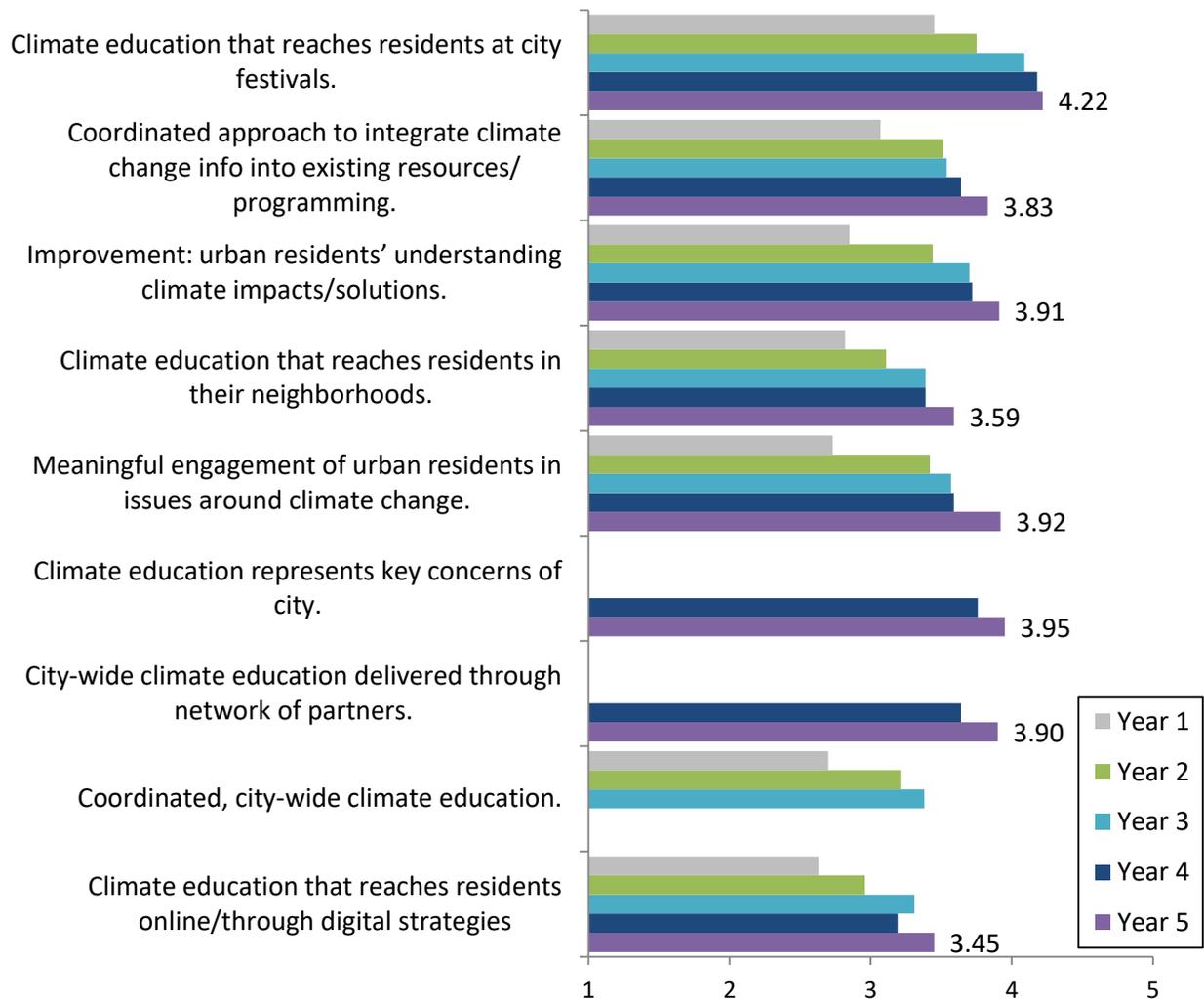
Since Year 2, local partners selected the same top four aspects of administration that contributed most to CUSP's success. In Year 5, *sharing resources* moved from second to first most commonly selected contributor to CUSP's success (after moving up from fourth in Year 3). Further, the top four contributors were selected by approximately three-quarters of respondents in Year 5, increasing from two-thirds the prior year.

- Sharing resources (77%)
- Exchanging information and knowledge (75%)
- Informal relationships created (75%)
- Bringing together diverse stakeholders (73%)

Partners exhibited increased confidence about the CUSP project meeting its ultimate objectives, particularly with respect to reaching residents at city festivals, with the highest ratings in Year 5.

Similar to CUSP core partner ratings, local partners have expressed increased confidence each year about meeting a range of CUSP project objectives. **Annually, the item rated highest was confidence that CUSP will result in climate education that reaches residents at city festivals.** In Year 5, several items increased relative to Year 4, particularly confidence that *city-wide climate education will be delivered through a network of partners* and that *climate education will reach residents through digital strategies*. While the digital strategy objective has been rated relatively lower than other objectives each year, partners have expressed slightly increased confidence over time, for the most part. There were no significant differences across cities. See Exhibit 24.

Exhibit 24. Partners' Confidence that CUSP Will Ultimately Meet Objectives: Years 1-5



Year 1 N=45; Year 2 N=55; Year 3 N=87, Year 4 N=88, Year 5 N=91
 Scale: 1 (Not at all confident) to 5 (Extremely confident)

Local partners, after Year 5, still knew little about CUSP in other cities, and a small number of partners reported they had collaborated with those in other cities in the past year.

In Year 5, a majority of local partners again reported knowing *only a little* (44%) or *nothing* (46%) about CUSP in other cities; 9% knew *some*. A small percentage (18%) of respondents reported that they did collaborate or connect with CUSP partners in another city in the past year. Those were primarily partners in Philadelphia, and they had collaborated mainly with partners in Pittsburgh. A handful of other collaborations were reported within and across each of the four cities.

Partners' goals going forward reflect interest in continuing to work together to promote increased awareness and interest in adaptation and mitigation of climate change impacts on a community-wide scale.

Approximately two-thirds of partners hope the *local organizations will continue to collaborate and remain committed to communicating the basics of climate change*, including impacts, mitigation, and adaptation, and *continue to implement the CUSP model* within their own organization. There were no differences in these goals across the four cities.

The top three goals respondents had for **community residents** going forward were the same as in prior years. Again, the most commonly selected goals for community residents included the following:

- Increase awareness of local climate change impacts and solutions that make sense at the community scale (71%)
- Increase belief that their neighborhood can respond to climate change on a community-wide scale (66%)
- Feel a greater need to adapt to/mitigate impacts of climate change on a community-wide scale (61%)

There was less interest in residents *increasing self-guided learning about climate change and what can be done to adapt to and mitigate impacts on a community-wide scale* and in residents *becoming more involved with network members*.

CHAPTER 4: URBAN COMMUNITY RESIDENT LEVEL FINDINGS

EFFECT OF CUSP EVENTS ON COMMUNITY RESIDENTS

Beginning in July 2015, GRG launched an online tracking form (CUSP Activities Form) to record all CUSP-related activities across the four cities. The initial intent was for the local partners (i.e., local ULN members) in each city who facilitated any type of CUSP event, meeting, or activity to record that activity. The online form allowed for local partners to provide the date, title, purpose, expected and actual attendance, and key challenges and accomplishments. The online form was active from July 2015 through September 2017. During that time, GRG collected data from 137 CUSP events: 115 events from Philadelphia, 20 from Pittsburgh, and two from New York.

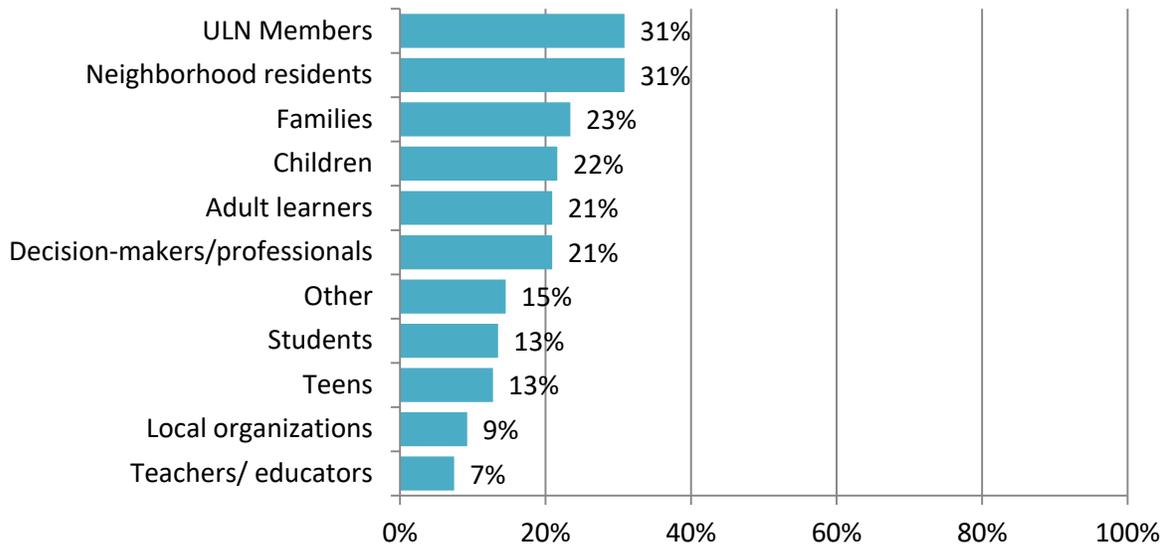
During an all-partners meeting in March 2016, CUSP core partners agreed that this system (local CUSP partners entering the data after an activity) was not ideal in all four CUSP cities. For those who did not have local partners entering their data, GRG agreed to review the quarterly reports to NSF and extract and enter the relevant data into the online form. Using this procedure, GRG captured data from an additional 192 events: 55 from Philadelphia, 57 from Pittsburgh, 43 from New York, and 37 from D.C. All total, the CUSP Activities Form captured feedback from 329 CUSP events: 170 (52%) from Philadelphia, 55 (23%) from Pittsburgh, 45 (14%) from New York, and 37 (11%) from Washington, D.C.

Audience

CUSP activities and events varied in purpose, location, and size. On the activities form, local partners described attendees; GRG coded a representative sample of entries to identify the types of community members and stakeholders for whom these activities and events were designed. Events varied considerably, with some events catering to one specific group (e.g., local ULN members, teens, or educators) while other events, such as community science festivals, catered to everyone and anyone.

Nearly one-third of reported CUSP events catered to ULN members and/or neighborhood residents. Nearly one-quarter catered to families, children, adult learners, and/or decision-makers or industry professionals. An additional 15% of events served members in the community not explicitly identified in Exhibit 25, such as senior citizen groups, city government officials, volunteers, and Block Captains.

Exhibit 25. Audience for CUSP Activities and Events Since July 2015 (Middle of Year 3)



Note: Percentages total to more than 100% because entries were able to list multiple intended audiences. N=282; a representative sample of entries

Events were highly diverse, with some local partners expecting two or three attendees at smaller and more focused meetings, while others expected many thousands at larger events such as city-wide science festivals. Expected attendance ranged anywhere from two to 3,000 attendees per event, and actual attendance ranged from zero to 50,000 participants. There were a few extremely large events, but the most common event size was approximately one hundred attendees. **At more than half of CUSP-facilitated events, more people attended than were expected.**

Key Challenges

Local partners encountered a variety of challenges when facilitating CUSP events. While approximately one-third (37%) of facilitators reported no challenges, the remainder (63%) primarily experienced logistical issues (e.g., space, bathrooms, audio, materials, staffing, technology). Among those who experienced challenges, nearly half described these in their own words. Representative examples follow.

“Attendees spoke a large variety of languages, which made collecting evaluation surveys difficult.”

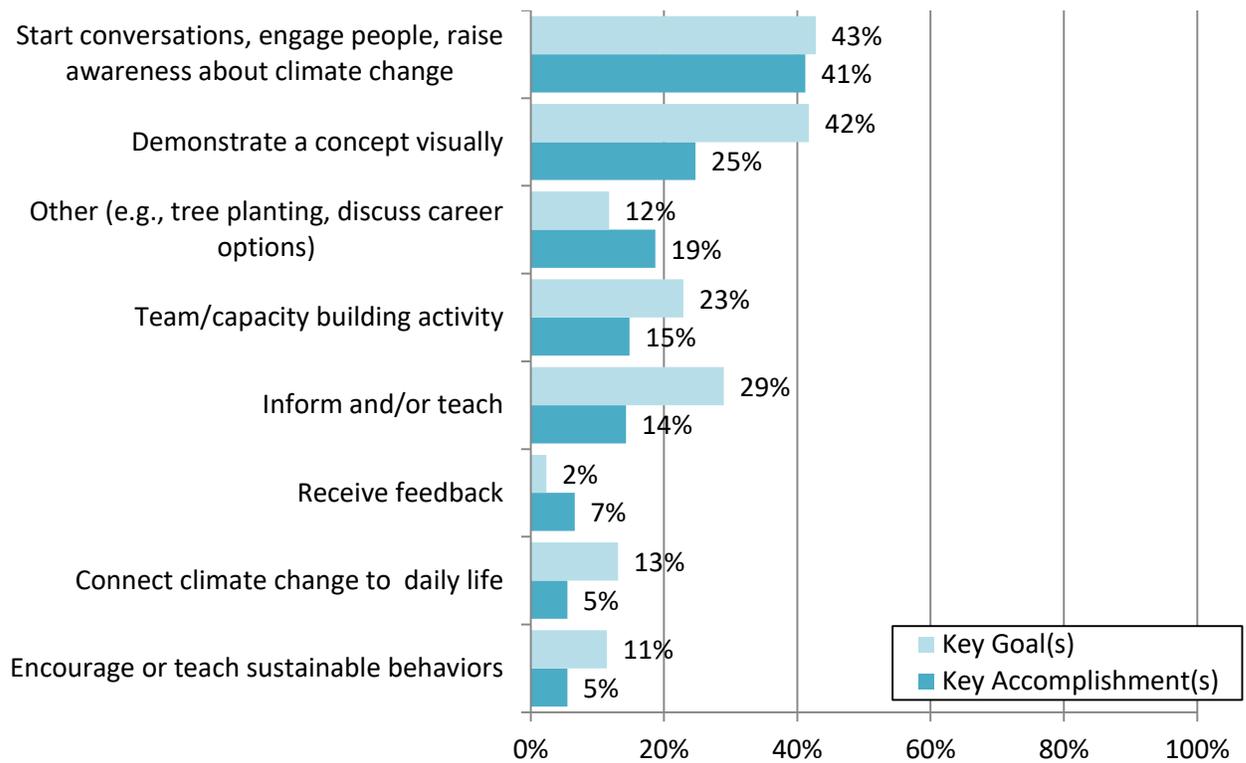
“Condensing material into a short time slot given the distinguished panelists.”

“Introduc[ing] a large number of programs & ideas in a short time”

“Some attention spans weren't able to last as long as the activity.”

“We need to increase the amount of signage at the station, including infographics and fun facts that convey what we also say to participants.”

Exhibit 27. Public Events Since July 2015: Goals and Accomplishments



Note: Percentages total to more than 100% because entries were able to list multiple intended audiences. N=282; a representative sample of entries

CUSP PUBLIC EVENTS

At the beginning of Year 3, GRG developed a one-page paper intercept survey to be administered by individual city conveners at public events showcasing CUSP activities or programming. In all, the survey was completed by 560 attendees across 10 CUSP events in three of the four CUSP cities (Philadelphia, Pittsburgh, New York). The majority of events (eight out of ten) were in the fall (September), and two were in the spring (April).

Across all events, attendees varied in their exposure to prior public events. One-third (37%) reported they had already attended similar public events earlier that year, while two-thirds (63%) reported that they had not done so.

Event survey respondents were moderately diverse in age, gender, and race/ethnicity:

- Attendees were predominantly female (66%).
- One in five respondents was younger (≤18 years old; 17%), the large majority were adults (18-64 years old; 77%), and one in 20 were senior citizens (65+ years old; 6%).
- Across all cities, the majority of attendees were White/Caucasian (70%), followed by Black/African American (18%), Asian (12%), and Hispanic or Latino (6%).
- More than half of all respondents (65%) were highly educated; one-third had earned a degree from a 4-year college, one-quarter had earned a Master’s degree, and one in 10 had

completed a Ph.D. Education level is particularly high considering that nearly 20% of survey respondents were less than 18 years old.

Attendees were asked to rate the event overall (e.g., Science Festival, Street Fair, Greenfest) as well as the CUSP programming specifically (e.g., Climate City Tables, Climate Change Playground). On a scale of 1 (*Poor*) to 5 (*Excellent*), the majority of respondents rated both the event overall (Mean=4.19) and CUSP programming (Mean=4.12) as either *very good* or *excellent*.

Respondents were attracted to CUSP programming primarily because of the kid/family-friendly activities (28%), general curiosity (26%), and interest in learning about and exploring educational topics (23%). One in ten respondents visited the CUSP programming because of their own personal environmental concerns.

Respondents reported on a scale of 1 (*Not at all*) to 5 (*A great deal*), the extent to which CUSP programming helped them learn about and become interested in climate change and the environment.

- CUSP programming was most successful in *making learning about climate change & the environment fun* for attendees (mean=4.11).
- CUSP was moderately successful in helping attendees *learn about potential responses & solutions to climate change* in their city (mean=3.95) and helping attendees *connect to potential impacts of climate change* in their own city (mean=3.92).
- Relatively lower ratings were seen for the increasing respondents' interest in learning more about climate change and the environment (mean=3.73). This is likely due to already high levels of interest among attendees.

For the most part, respondents were highly engaged with new activities related to CUSP programming. The majority (62%) was exposed to new activities they had not seen before. CUSP programming was highly interactive; three-quarters of respondents reported they had the chance to handle and work with materials, and two-thirds voiced a question or comment with the person facilitating the activity.

Approximately one in five respondents identified CUSP as the organization responsible for the CUSP-specific programming. Most respondents listed other partnering organizations or government bodies (e.g., The Franklin Institute, local city government, Carnegie Museum of Natural History, National Science Foundation, Alcosan). As most of these CUSP events were part of a larger event, respondents in some cases may have confused overall event organizers with the CUSP area organizers.

Importantly, though, respondents were frequently able to correctly identify at least one of CUSP's primary purposes through their interaction with activities/programming. More than half of respondents understood CUSP aimed to educate and create awareness about environmental issues, while one-quarter stated that CUSP aimed to educate and create awareness about the impacts of climate change specifically. One-quarter understood that CUSP programming encouraged and taught attendees about sustainable practice and solutions. Less prevalent were people who felt CUSP aimed to engage children (11%) or focused on local community-based solutions (10%).

In their own words, respondents often captured multiple components of CUSP's mission:

“Informing people about the changing environment of Philadelphia and how to deal with the changes.”

“Share knowledge + enthusiasm for local sustainability”

“To introduce children and parents to our environment in a fun and interesting way. Not too much to push you away”

Follow-up Survey

At the end of the public event intercept survey, respondents were asked to provide their email addresses if they were willing to be contacted again four to six weeks later to complete a follow-up survey. Of the 560 event survey respondents, 126 (23%) provided a valid email address. Thirty of those individuals completed the follow-up survey (response rate=24%). As compensation for completing the follow-up survey, respondents received free passes to their local CUSP-affiliated museum.

Overall, CUSP programming was relevant and memorable for respondents. Two in five reported noticing things in their daily life that related to something they learned at the CUSP event they attended. Half reported speaking with someone about what they learned at the event. Half of those respondents spoke with a family member or friend who was at the event with them, while the other half spoke with someone not in attendance. Most often, respondents spoke about the hands-on activities they experienced.

One-third (31%) of respondents had changed some aspect of their daily life, started a new activity, and/or joined a new organization or program because of something they learned at the CUSP event. Examples of changed behaviors include reduced water use, turning off lights more consistently, and making donations to sustainable organizations. Another third (31%) reported they had not yet changed any behaviors or activities, but had plans to in the near future because of the CUSP programming. Examples of anticipated behaviors included planting a garden, increasing their children’s awareness, and doing independent research to learn more. About four in 10 people (38%) reported they had not changed any behaviors and did not intend to.

CHAPTER 5: OVERALL EVALUATOR OBSERVATIONS

CUSP CORE PARTNERS

The CUSP core partnership became strong and functional over the five project years; a successful collaboration was created and sustained.

Core partners functioned well as a group, coming together more and more each year. Based on regular annual survey feedback, along with ongoing discourse, the core partners were largely satisfied with most facets of their involvement in CUSP. They perceived and described many professional and personal benefits attributable to their participation in the project. In the final project year, partners were increasingly satisfied with the collaborative work, and confident that the project goals and objectives would be achieved. Over the five years, evaluators continued to see growth in ratings of satisfaction and perceived success in the annual surveys. Notably, partners in each city have expressed interest and focused attention to strategies to sustain collaboration within and across the cities beyond for official grant period.

URBAN LOCAL NETWORK (ULN) PARTNERS

The complex local networks created in each CUSP city have evolved and strengthened over the five project years.

Across all four cities, local partners came to understand and become more invested in CUSP over the years. Each year, local partners reported enhanced promotion of the project and participation in CUSP activities intended to engage the public in climate change education. Additionally, similar to core partners, they too experienced and identified professional and personal benefits attributable to their CUSP participation. They saw benefits to their own organizations, particularly with respect to new connections and partnerships created, and well as for their intended audiences. Local network functioning and participation varied across the four CUSP cities and over time. Not all local partners participated in every event; city conveners became comfortable with the fact that it was not necessary for every single partner to be involved in all CUSP activities. This reflects success in that both core and local partners recognized the value of different partners filling different needs as relevant.

Mini-grants became a highly successfully partnership model between core partners and local network partners, who worked together to propose, receive, and implement community-based projects. Local partners who received a mini-grant noted positive impact on their own organizations in terms of growth and strengthening. They provided increased access to and engagement with personally relevant connections to climate change education among their intended audiences at the neighborhood and city levels through ongoing conversations and learning.

COMMUNITY MEMBERS

Increasingly over time, CUSP has successfully improved city residents' understanding of and engagement with climate change issues at the local neighborhood or city level.

Among both core partners and local partners in each city, there has been clear interest in ensuring that the climate-related messages and resources ultimately disseminated are of high quality, meet users' needs, and achieve the project goals as well as the broader goals of the NSF. Community residents in urban areas were exposed to a variety of CUSP programming that reached a broad audience of children, adult learners, and families. Residents reported increased awareness of climate change impacts and potential solutions in their communities, and stated an interest to learn more and to participate in similar activities in the future. Based on CUSP public event attendees' feedback, the activities successfully conveyed the CUSP messaging. Across a wide range of events in each of the CUSP cities, visitors enjoyed the experiences, felt they learned about the environment, and showed some interest in following up and learning more.

Overall, after the five year implementation period, the CUSP project achieved its goals of creating comprehensive networks of community organizations in four cities to educate urban audiences about climate science and the urban impacts of climate change. Core partners connected and collaborated as a group, learned from one another's interdisciplinary areas of expertise, worked together on joint projects, and helped with the implementation of CUSP's multiple platforms in each CUSP city. Local partners from community organizations in each city ultimately delivered multi-platform, targeted, coordinated climate change education programs. These programs have begun to impact urban populations' understanding of and engagement with climate change. As a strong indication of successful collaboration and commitment, both core and local CUSP partners intend to continue to share the CUSP messaging with their audiences beyond the life of the grant.

APPENDIX

Appendix A: Annotated Surveys

Appendix B: SNA Images

Appendix C: Descriptions of Collaboration Levels in Four Areas

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