Evaluation of Statistics for Action (SfA)
Final Report
March 5, 2013

Submitted by Arbor Consulting Partners[1]

[1] Margaret Connors, Ph.D., Mindy Fried, Ph.D. and Madeleine Taylor, Ph.D.

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List of Organizations and Organizational Acronyms

Statistics for Action (SfA)
Toxics Action Center (TAC)
Blue Ridge Environmental Defense League (BREDL)
Little Village Environmental Justice Organization (LVEJO)
Pesticide Watch (PW)
Operation Green Leaves (OGL)

Clean Air Now (CAN)
Environmental Neighbors United Fighting Fumes (ENUFF)
Somerset Coalition for Clean Air (SCCA)
Center for Urban Transformation (CUT)
Citizens for a Healthy Environment (CHE)
Coalition of Communities for Environmental Justice (COCEJ)
Los Angeles Environmental Justice Network (LA EJ Network)
Monterey County Safe Strawberry Campaign
Neighborhood Environmental Watch (NEW)
Oak Park Elementary School (ES) and Susanville High School (HS), Sacramento, CA
People for Community Recovery (PCR)
People United for Dignity and Justice (PUDJ)
Pilsen Environmental Rights and Reform Organization (PERRO)
Santa Cruz County Safe Strawberry Campaign
Universidad Popular Chicago (UP)

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I. Introduction

In the fall of 2008, TERC hired Arbor Consulting Partners to conduct a mixed methods evaluation of Statistics for Action (SfA). Over the past four years, our evaluation has included both process (project implementation) and impact (project effectiveness) assessments. Initially, we developed a Logic Model (see Appendix 1), in conjunction with SfA staff, which articulated the causal links between program inputs and outcomes. We posited a cascade-like impact of SfA, in which new materials would be developed by TERC staff; a host of environmental organizations would be trained to utilize them with grass roots community groups; and these groups would then incorporate SfA into their ongoing environmental campaigns. Ultimately, we theorized, the public messaging around environmental issues would be strengthened by SfA's materials and by the systematic approach of incorporating numbers and statistics into environmental action campaigns.

In Years One and Two, SfA partnered with one main environmental organization (EO), Toxics Action Center (TAC), and then added three additional environmental organizations in Years Three and Four: Little Village Environmental Justice Organization (LVEJO), Blue Ridge Environmental Defense League (BREDL), and Pesticide Watch (PW). In addition, Operation Green Leaves (OGL), and specifically its cable television program, Eco-Alert, was included as a partner. These original partners have remained with the project. In addition to incorporating SfA into ongoing campaigns with community groups, partners broadened their focus to utilize SfA materials and training in diverse public venues, including conferences, presentations, and special events. Over the last year, a number of new EOs were exposed to SfA, including: the Coalition of Communities for Environmental Justice (COCEJ), the Los Angeles Environmental Justice Network (LA EJ Network), and three Chicago-based nonprofit groups (not affiliated with LVEJO), including People for Community Recovery (PCR), Center for Urban Transformation (CUT), and Pilsen Environmental Rights and Reform Organization (PERRO). In addition, adult learners in three cities reviewed and assessed SfA content in the magazine *The Change Agent*, including over 100 students enrolled in adult education classes in New York City, 48 students in English as a Second Language (ESL) classes offered at Universidad Popular (UP) in Chicago, and 13 students from an adult education group in Boston.

[2] Margaret Connors, Ph.D., Mindy Fried, Ph.D. and Madeleine Taylor, Ph.D.

We are pleased to report that TERC staff employed extraordinary creativity and flexibility in implementing Statistics for Action and, despite a number of hurdles they faced along the way, achieved impressive results. All major initiatives are bound to encounter obstacles, so the success of a project must be assessed by its capacity to recognize those hurdles and to find innovative ways to overcome them. TERC staff initially took the time to ground themselves in the world of environmental organizing; they worked tirelessly with environmental organization partners over the four-year period, winning their trust and admiration; and together, TERC staff and environmental organization leaders found creative and innovative ways to grow and adapt the project, even when faced with obstacles.

In this report, we begin by describing our methodology, and then present our major findings, based on four years of on-going involvement as project evaluators.

II. Research Methods

Throughout the four years of the SfA evaluation, we have implemented a rigorous program of data collection, employing both quantitative and qualitative methods. In the first two years, our focus was on formative research, as we studied the early process of SfA project implementation and provided information to TERC that could be used for project improvement. In year two, we began to track early outcomes for TAC, the first environmental organization (EO) to join the project, and continued to provide feedback to TERC staff. Over Years Three and Four, we simultaneously tracked outcomes for TAC, and collected baseline data and documented the implementation of SfA within the new partner organizations: LVEJO, PW, BREDL and Operation Green Leaves. As EO's engaged community groups and broadened their application of SfA to engage peers, we documented the impact of SfA on these important constituencies. As TERC staff engaged new partners, the evaluation broadened to assess the work of these new groups, including the LA EJ Network and COCEJ in Mississippi.

Over these four years, our focus has been on gathering in-depth information about the impact of SfA on environmental organizations' capacity to use numbers, data and measurement in their environmental organizing and the consequent effects both on the members of community groups that EOs serve as well as on EO peers. Ultimately, we have looked at the extent to which SfA has been institutionalized into the ongoing work of EOs.

Our research methods over the four years have included the following:

- **Development of protocols**

Initially, we developed a comprehensive set of protocols to capture baseline and follow-up data for environmental organizers and community group members. In Year 3, as SfA was expanding

its approach, we also developed a number of new protocols to capture the broader impact of the project, including: an activity evaluation form, an assessment of public response to *The Change Agent*, and a protocol to document the public reach of SfA events (see Appendix B).

- **Baseline and follow-up surveys with EOs**

We have conducted baseline and follow-up surveys with all EO staff and directors, which we have used for comparative analysis. In the fourth year, we gathered final surveys from all of the EO staff and directors.

- **Focus groups with TAC staff/leadership**

We conducted annual focus groups with TAC staff/leadership, to assess staff knowledge about numeracy and statistics, their leadership capacity to share this information with others, and their level of implementation with community groups. As TAC was the first organization to join the project, these regular focus groups provided a valuable point of reference for the assessment of project impact on the EOs that joined subsequently.

- **Focus group interviews with select community groups**

Over the four years, we conducted focus groups with several community groups that sustained involvement in SfA. These included two community groups working with TAC, two community groups working with Pesticide Watch and community group members working with LVEJO.

- **Participant observation during regular conference calls with TERC staff and Environmental Organizations (EOs), and at Advisory Committee Meetings**

Throughout the four years, we monitored regular monthly or bi-monthly conference calls that TERC conducted with each of the EOs for planning and/or assessment purposes. Regular participant observation provided information about the evolving collaboration between TERC and the EOs, as well as insight into challenging issues that arose over the course of the project and how these were resolved. Evaluators also attended the two meetings of SfA's Advisory Committee, in which EO staff worked side-by-side with SfA staff and advisors to better understand how to incorporate numbers and statistics into their organizing work.

- **Review of materials generated by TERC and each of the participating partners**

We reviewed and analyzed a plethora of materials generated through SfA over the course of four years, including notes from SfA meetings and conferences, videos from events, and SfA-related materials generated by partners. This research provided valuable context and substance for our analysis of project strengths and challenges.

- **Interviews with staff/leadership of EO groups**,

In order to more deeply understand the impact of SfA, we conducted interviews with leadership and key staff in all participating EOs over the four years of the project, to elicit their assessment of the impact of SfA training and materials, and to hear any recommendations they had to strengthen the project.

- **Focus group with members/friends of Operation Green Leaves (OGL) following screening of two SfA-related videos for Miami public television**

We viewed two SfA-related videos with a select group of OGL Board members and supporters, and conducted a post-screening focus group to assess the impact of the videos on participants.

- **SfA Activity Survey**

We surveyed community members and other audiences, including EO peers and workshop participants, who were introduced to SfA activities over the course of the project.

- **Public Reach Survey**

In an effort to better understand the reach of SfA, we collaborated with TERC to develop a survey which documents EO application of SfA with audiences at events and through public media.

- **Change Agent Survey**

In order to document the responses of adult learners to SfA-generated content in *The Change Agent* magazine, we designed a short survey that was delivered to adult education teachers in New York City and Boston for distribution to students in their classes who read the magazine. In Chicago, students in ESL classes at Universidad Popular reviewed *The Change Agent*; the survey was administered in this case by a subcontractor to SfA (a former LVEJO organizer). Finally, a TAC organizer distributed *The Change Agent* to 13 adult education students. These students also completed the survey.

- **SfA website review**

TERC solicited reviews of the project's web-housed materials and gathered results in an online survey. We conducted an independent analysis of survey results and have incorporated findings in this report.

In addition, we have had ongoing informal conversations with TERC staff to better understand their goals and strategies for implementing SfA.

III. Adaptation of the SfA Logic Model

The SfA Logic Model, which we developed at the outset of the project, provided TERC with a tool for reflecting on plans for – and the reality of – project implementation. As designed, the Logic Model maps a sequence of causal links between TERC's initial development of materials, to its uptake by environmental organizations, to its use at the community level (see Appendix A). As represented in the model, TERC would initially develop a set of strong materials, rooted in the experience of environmental organizing work. TERC would play the lead role in training New England-based environmental organization Toxics Action Center (TAC) in the early stages of the project – in Years 1 and 2 – and during that time, TAC would provide input into the development of materials. With their growing knowledge about how to use numbers and statistics in their organizing work, TAC staffers would increasingly begin to utilize SfA with its community groups, incorporating materials and approaches to numeracy into environmental campaigns throughout New England.

This cascade effect – in which environmental organizers are the catalysts for bringing SfA to the community groups who then incorporate numeracy-rich materials and approaches into their campaigns – was designed to be the approach for all of TERC's main environmental partners, including the three groups that joined the project in Year 3: Little Village Environmental Organization (LVEJO), Blue Ridge Environmental Defense League (BREDL) and Pesticide Watch (PW). In addition to representing this cascade effect, the original Logic Model also mapped the causal links between TERC, the EOs and the larger public, including outcomes through its work with Operation Green Leaves.

TERC's Logic Model provided an excellent framework to assess the process of SfA implementation and, as the first organization to join SfA, TAC was the initial "test case." From the outset, TAC evidenced a significant level of organizational buy-in and commitment to SfA. As anticipated in the Logic Model, TAC staff collaborated with TERC in the creation of SFA materials and became adept in the use SfA approaches. TAC also incorporated SfA into the broader roster of technical assistance and supports it provides to community groups and now includes SfA as a component of all new staff training. At the same time, TAC organizers encountered important challenges along the way. Among these was determining how, and at what stage in the life of a campaign, to incorporate SfA materials and approaches. Organizers found that when community groups were responding to a crisis – a relatively frequent occurrence given the nature of their environmental problems – there was resistance to incorporating SfA tools and training into their campaigns.

Ultimately, TAC found that it could be challenging to fully incorporate SfA into ongoing organizing campaigns, but that SfA could be introduced successfully at opportune moments in a group's development. With this in mind, TAC staffers began to introduce selected elements of

SfA into their environmental organizing, using their knowledge and expertise to choose the appropriate activity to advance a particular piece of a community group's work.

EO's who joined the project in Year 3 (BREDL, PW and LVEJO) experienced a similar trajectory. As in the case of TAC, TERC worked closely with EO staffers in each of these other EOs, resulting in one or more staff becoming proficient with SfA materials and approaches. And, like TAC, these EOs have increasingly exhibited a commitment to institutionalizing SfA in their organizing work. As laid out in the original SfA Logic Model, EOs that joined in Year 3 also tried to incorporate SfA into ongoing environmental campaigns. But, like their TAC counterparts, EO organizers from these groups faced obstacles, including challenges in finding the right timing and/or appropriate stage to incorporate SfA. As described in later sections of this report, all EOs ultimately adopted creative strategies for incorporating SfA into their environmental organizing. They did so because they found that, implemented appropriately, SfA's numeracy-rich materials and approaches contribute vitally to their work.

Ultimately, the SfA Logic Model provided a framework that was instructive, but it required adaptation.

TERC staffers had initially imagined that organizers would do basic math activities with community group members, in order to better understand relative quantities. But organizers were less interested in basic math for its own sake than they were in numeracy activities directed toward a messaging goal. They wanted to understand math as a vehicle to make comparisons of quantities and to convey environmental risks to an audience they were either trying to mobilize (e.g., other community members) or challenge (e.g., policy makers). TERC staff responded in kind, revising their expectations to align with the reality on the ground. In the materials they developed, TERC staff situated math within science learning and better contextualized opportunities for skills practice.

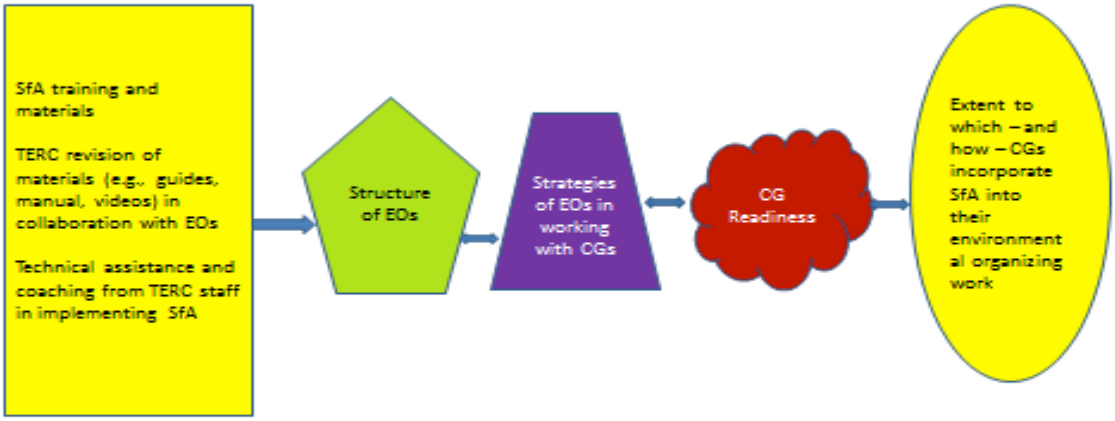
Ultimately, lead staffers in each of the EOs who were engaged in the project recognized the critical importance of numeracy in strengthening their work at the community level. This belief in the mission of SfA was a constant that resulted in the exploration of opportunities to successfully implement SfA with community groups and in other settings. As evaluators, we broadened our investigation of SfA in line with this evolution in the project's focus. At the same time, we discovered that how SfA was implemented varied among the organizations, depending on their structures and leadership/training styles.

IV. Research Findings

1. Environmental Organization (EO) Structure and Strategy influences ways in which SfA is implemented

In our previous (Year 3) report, we presented an analysis of the organizational structure of the four EO groups and how this affected implementation of SfA. We now contend, based on our analysis and synthesis of data over the past four years, that the organizational structure of environmental organizations, in concert with their strategic approach in working with community groups, combine to affect the extent to which EO's implemented SfA with community groups (CGs) as well as the extent to which CGs incorporate SfA into their work.

Links between EO organizational structure and use of SfA at CG level



- ***Contrasting Cases: TAC and LVEJO***

We begin with the example of Toxics Action Center (TAC), based in New England. With a small staff, including an Executive Director and between five and seven organizers at any one time, the organization supports the environmental advocacy efforts of a myriad of community groups in small towns in New England, including Vermont, Massachusetts, Connecticut, New Hampshire, Maine and Rhode Island. The organization is committed to preventing or cleaning up pollution at the local level, and has helped organize over 626 communities across New England in local campaigns. Each of the TAC organizers is charged with being the lead organizer in 1-2 states, and may have several active community groups with whom they work at any one time.

The groups they work with are primarily Caucasian, although there is socio-economic diversity even in the primarily white communities. Since small towns in this region have a significant degree of political autonomy, community groups tend to focus their advocacy efforts at the local level, although some also work to effect change at the state level as well.

TAC staff frame their work with community group members as "consultations". Their work with these groups is organized around a set of eight training workshops which are designed to help community groups develop and implement a successful environmental campaign. Typically, a small group of community members will contact TAC for help with a local environmental problem. Often, according to Executive Director, Sylvia Broude, they come to TAC without any real understanding of what organizing entails. In fact, she says, they don't want to "actually be organizing their neighbors and leading a community group to tackle a pollution problem!" Sometimes, TAC is also contacted by people who are more seasoned community activists. When that happens, says Broude, there may be more pressure to demonstrate that they have the skills and expertise to help them. In presenting the set of eight workshops offered to community members and/or activists, TAC helps them determine which ones will be the most useful in advancing their environmental campaign.

The eighth consultation – "Interpreting Test Results" – which was added this year, is informed by SfA materials and approaches. The goal of this consultation is to help community members understand data from environmental tests and make a plan to use these data to support their campaign. It also focuses on helping community members select the most effective way to communicate their test results to the public and/or to decision-makers. Thus far, one group has opted to include this SfA workshop as part of its overall work with TAC.

According to the former Executive Director, Meredith Small, the new consultation workbook on SfA-related material is "our best example of institutionalizing the material in our own framework. (The community groups) pick and choose. It's a little bit of 'choose your own training'". TAC's training workshops provide a concrete way for staffers to demonstrate to community groups that they have the expertise to help them, and to provide a roadmap to guide the organizing process. Given that TAC is structured with this consultation model, it was relatively easy for them to add an SfA-inspired workshop to their toolkit. Having a module specifically focused on SfA-related materials broadens the range of skills they can offer and helps to sustain their SfA work. TAC staffers operate as a team, meeting regularly to share experiences and update on the progress of all their various campaigns. With their structured "consultation" model, they have a shared language and strategy that frames their work and SfA has now been incorporated into that language. Given that SfA has been incorporated into its organizing model, TAC organizers are encouraged to use their knowledge and skills related to numeracy to assess the "readiness" of community groups, and to determine the extent to which they can utilize SfA materials and approaches in their organizing work with them.

Moreover, TAC staff work closely as a team that meets regularly to strategize and coordinate their efforts. As they have incorporated SfA into their work, they have been able to train and coach organizers, in an ongoing way, to incorporate SfA into their organizing work throughout New England.

In contrast to TAC, which is a regionally-based organization that supports local community action in six states, LVEJO is a local organization that mobilizes residents in one community called Little Village, which is a low-income, primarily Mexican-American community on Chicago's West Side. The number of staff has fluctuated over the past four years, starting with four in addition to the Executive Director when SfA began, and then dwindling to only one during a time of crisis, and now back up to four again. Two staffers were initially trained in how to use SfA materials and training, but ultimately only one staffer maintained her involvement in the project throughout the two years of implementation.

LVEJO supports a number of locally-based campaigns that address environmental injustice in the community. Staffers are each responsible for one or two campaigns, and the amount of coordination among them varies. Among the campaigns are: a Clean Power campaign, which has mobilized residents to remove two of the largest polluters in the community; a public transit campaign, aimed at improving fair access for all Chicago riders, but with special focus on helping transit dependent, low-income riders in Chicago's low-income communities; and an "Open Space" campaign, which successfully advocated for a local park, instead of a proposed superfund toxic waste site. In addition, in conjunction with the Open Space campaign, LVEJO maintains a community garden which engages volunteers and makes the link between clean air and soil and the provision of local, healthy food.

As an environmental justice organization, the mission of Little Village is to improve the environment and quality of life of residents of Little Village and of other neighborhoods of Chicago "through democracy in action". Unlike TAC and the other partner groups involved in SfA, LVEJO does not have separate community groups that are spread out throughout a region. All of the work carried out by LVEJO relates to this single low-income Latino community.

Selene, the one staffer responsible for SfA in LVEJO, worked autonomously without input or supervision from the organization's leadership. With total autonomy to implement SfA, she took her charge seriously, using SfA materials both in the context of campaign work as well as in LVEJO-sponsored public events, where she roamed the crowds, engaging community members in SfA-inspired exercises about pesticide consumption. Her creativity and initiative was what made SfA "hum" in LVEJO, because of her excitement for SfA resources. While her autonomy allowed her wide discretion in implementing the project, SfA was not integrated into the organization. In fact, the structure of the organization was too amorphous to ensure

consistent use of SfA in the community it served. Without coordination among other staff, and with a detached approach from leadership, there was no effort to spread the use of SfA in LVEJO, or institutionalize its use with community members.

During the implementation of SfA, LVEJO also experienced an organizational crisis, which affected SfA implementation. During this crisis, all of the staff was laid off, including Selene, the one staffer who was committed to implementing SfA. The fact that LVEJO had not embraced SfA more broadly, and integrated it into other projects with other staffers, meant that the loss of this one staffer was potentially the end of SfA at LVEJO. Nonetheless, LVEJO's Executive Director recognized that the organization had a sub-contract with TERC which they were obligated to fulfill. And so after a hiatus in which a few new staff members were hired, LVEJO re-engaged with SfA in two ways: the Executive Director worked closely with TERC staff to prepare for a training session with parents, using SfA materials. And a new staffer – formerly a high school volunteer with the organization – was hired to conduct "Toxic Tours" which incorporated SfA materials into their use of "isense", an iphone app that helps record and aggregate individual assessments of toxic odors. At last report, LVEJO's Executive Director predicted ongoing continued use of SfA with Toxic Tours, as well as to some extent, use of SfA with parent groups. Whether LVEJO will continue to implement SfA beyond the life of its relationship with TERC is unclear.

These two organizations exemplify very different organizational models, both in terms of how they are structured and how they approached SfA strategically. In TAC's case, SfA was made an intrinsic part of the organization's work with community groups, and its structure, combined with its strategic use of SfA with community groups resulted in community group engagement with SfA materials and approaches. TAC organizers were all engaged with SfA, and encouraged to use the materials and approaches with community groups. With LVEJO, SfA was not integrated into the structure of the organization or its overall strategy. Only one staffer regularly used SfA with community groups in an isolated fashion with no input and little support from the organization's leadership. Only after a major lay-off, which resulted in the loss of the one staffer with SfA experience, and with the continued obligation of the organization to fulfill its contract, did the Executive Director rethink how to incorporate SfA into LVEJO's work.

- ***PW and BREDL: Structure and Strategy***

Pesticide Watch has a similar structure to TAC, in that organizing staff take the lead in supporting environmental campaigns of community groups in a large region – in this case, throughout the state of California, mainly in the region of Greater Sacramento Valley. PW offers a series of workshops to community groups, which cover many of the same topics as those covered by TAC. These are geared towards providing a foundation for organizing and winning environmental campaigns. PW has also incorporated a number of SfA materials into these workshops, although the organization has not added a specific module that is devoted to

SfA materials, as TAC has done. PW staffers have prioritized the use of SfA in several of their campaigns, in particular, a campaign aimed at stopping the use of a toxic pesticide called methyl iodide. PW's organizational structure and organizing strategy is well-adapted to the implementation of SfA being delivered both through community workshops and through the introduction of specific SfA materials or activities when local campaigns permit.

BREDL is also a regionally based non-profit that supports the environmental campaigns of community groups, in this case, in low-income and rural communities across the southeastern United States. BREDL is structured slightly differently, however. The nonprofit serves as the hub of a network of community groups or Chapters, each of which is engaged in a grassroots effort to address a local environmental challenge. Chapter leaders together decide on the admission of members, currently numbering over 30. BREDL staff support this membership in a variety of ways, including ways that provide regular opportunities to introduce SFA, as follows:

- BREDL gathers and disseminates research on environmental topics and maintains a website that posts materials and information of use to local environmental advocates. As a result of their engagement with the project, BREDL staffers have increasingly applied what they have learned by developing and distributing materials that introduce numbers and statistics in a powerful and accessible way;
- Unlike other EO partners, BREDL regularly convenes community group leadership to share information and lessons learned. This allows BREDL staff to introduce SfA to Chapter leaders and to offer them some basic training in the use of SA resources. The scope of this training is narrower than the training that BREDL staffers have received from TERC but it does provide Chapter leaders with ideas, advice and materials that are relevant to their campaigns;
- Finally, BREDL organizers provide direct technical assistance to Chapters upon request, including support for campaigns and strategy planning. Although this direct work with Chapters sometimes presents opportunities to more deeply engage community members in SfA-related activities, BREDL's support for Chapters tends to be both highly targeted and episodic, reflecting the nature of local campaigns. Like TAC and PW, BREDL's staff and leadership are intensely invested in implementing SfA in their environmental organizing. Likewise, BREDL staff use what they have learned through SfA to improve or advance particular projects. In contrast to TAC and PW, however, BREDL organizers do not deliver regular SfA-focused workshops to community groups. Instead, BREDL introduces SfA to its Chapters in a more selective fashion as need arises within the large BREDL network.

2. SfA materials development offered opportunities for EO engagement

SfA is an interesting marriage of math literacy and environmental organizing, and at the core of this union is TERC staff's commitment to close collaboration and careful listening. TERC's

approach to developing materials has been grounded in respect for the environmental organizers and community members they encounter, and a commitment to applying lessons learned to the materials they develop for the project. An iterative process of developing and refining materials – in which EOs provide feedback to TERC staff and they respond with revisions or develop new material – has been critical to the high quality and relevance of materials produced for this project.

Over the four-year period, TERC has developed a full array of powerful materials, utilizing a Freierian approach;[3] that is, they are all grounded in the locally-based environmental issues of the environmental organizations. All EOs embraced the opportunity to work with TERC on the development of SfA materials in a collaborative way. EOs were also eager to share these products with funders, community groups and other potential supporters as evidence of the value they can offer. Given the sequenced entrance of EOs into the project, individual EO involvement in materials development varied. EO involvement also depended upon each organization's engagement with particular environmental campaigns.

- ***TAC's Role in Materials Development***

As the first EO to join the project, TAC has had the greatest and lengthiest involvement in SfA product development and revision, beginning with the development of TERC's proposal to NSF. A number of specific deliverables identified in the proposal reflected TAC's input, such as the development of hands-on activities and guides, the Journalist Toolkit, fact sheets, videos and the SfA web site. Once the project was funded, TAC staff continued to play a key role in providing primary materials upon which the SfA narratives and activities were based.

A first wave of materials was developed in 2009 and early 2010, during a period of intensive site visits in which TERC staff observed TAC community groups and introduced the project. Based on these visits, a series of very rough activities were developed and piloted with the community groups, reflecting the environmental issues/problems that were discussed during those visits.

TAC staff also suggested new materials to be developed by TERC, and provided feedback to TERC staff, which then prompted revisions to the materials. TAC staff offered what their director calls "primary source" material to TERC staff, which was then incorporated into the SfA manual. TAC also offered valuable advice about the Manual's use. For example, while they were excited about the materials, TAC staff was often stumped about how to facilitate their use, and shared this conundrum with TERC staff. This prompted the writing of the Facilitator's Manual, which was produced by TERC in October, 2010. Over the next several months, TERC

[3] Paulo Freire, a Brazilian educator and author of Pedagogy of the Oppressed, posited that adult literacy must be based on the learners' cultural and personal experiences, with material presented based on the learners' real-life experiences. Learners and teachers are mutual learners, with learners developing tools of literacy by discussing issues of concern in their lives, thus strengthening their engagement with learning.

also wrote several Guides to Environmental Testing and Health Resources, again based on input from TAC. The activities, ideas, and examples included – or *not* included – in these guides were based initially on the general topics that TAC and their community groups said they needed help with, as well as on specific feedback from TAC staff about the first-wave pilot activities. The Guides were also reviewed by TAC staff for feedback before publication.

- ***Continuing Evolution of Materials***

In the last two years of the project, TERC staff has continued to solicit and receive feedback from TAC as well as from the other EOs engaged through the project, including BREDL, LVEJO, Pesticide Watch and Operation Green Leaves. TERC has also reached out to other SfA partners, including Advisory Committee members Steve Dickens from River Network and Madeleine Scammel from Boston University School of Public Health, for feedback and advice. The current Facilitators Manual includes more than twenty activities, guides and community group feedback forms that organizers and others can use to help communities understand, analyze, and communicate environmental issues. According to TERC staff, "there is not a single activity in the new Manual that has not been revised in some way based on EO feedback." SfA guides focused on environmental testing and health have also been further adapted in the last two years with broad EO participation. Several SfA videos, including three EcoAlert episodes, which were aired on Miami cable television, provide illustrations of specific concepts that EOs said they needed to communicate better or better understand. Also, these videos were aired to local community OGL Board members and supporters, who provided useful feedback on the content as well as other venues for screening.

SfA materials developed with EO input located on the SfA website:

- More than 20 SfA Activities
- 4 Environmental Testing Guides;
- 16 Videos/films; and
- The Change Agent issue on environmental justice topics.

Organizers' feedback has been based in large part on their on-the-ground experience using SfA resources in communities. Examples include feedback from Pesticide Watch that community groups can rarely devote a full 90 minutes to "First Look" activities, and feedback from BREDL that a new resource "Making Graphs Work for You" would work best as a poster. Such advice led TERC to make several additions to SfA materials in the last two years. New SfA resources introduced since 2010 include:

- A re-design of "First Look Communicating with Numbers." A shorter version now appears on the SfA website as "Memorable Messages" with an accompanying handout "Numbers Make Your Message Stronger;"
- Other short activities based on materials in the Manual, that might take only15-20 minutes to complete;

- Hand-outs that can be used independently of an activity or with an activity, such as a take-home message or list of key tips and best practices.

TERC is also working on bundling activities that are related and creating links between them based on feedback that organizers need support figuring out which combination of activities is best suited to their situation.

Some materials that have been created through SfA have been adapted to meet a specific EO need. BREDL staff believed that new members of the League would benefit from a "starter" package of materials that would be immediately useful in their campaigns. The result is BREDL's New Chapter Packet that includes two "First Look" Workshops (Technical Documents and Challenging Claims), two Activities (Messaging with Analogies, and Risk-ranking) and three Guides (soil, water and hazardous waste). Since its release in March 2012, three new BREDL chapters in North Carolina and Georgia have begun to use these resources. Overall, TERC learned that staffers don't object to scripted materials like these, but do want to exercise maximum creativity when they deploy them.

Finally, SfA materials development has been influenced by feedback gathered in surveys to EOs and community members engaged by EOs. This includes surveys distributed in community settings in which SfA materials and approaches have been introduced and to reviewers of SfA materials that are housed on the web. This research, discussed in greater detail below, surfaced insights not only about what participants learned through exposure to SfA but also how SfA materials might be improved.

- ***Translation of Materials***

While TAC's and BREDL's constituencies are predominantly English-speaking, LVEJO and PW work in primarily Latino communities. In an effort to make SfA accessible to these Spanish-speaking communities, TERC staff translated 12 of the 21 activities they created in 2010, as well as their water quality guide, entitled "The SfA Water Quality Guide: Read Before You Drink". TERC staffers are now in the midst of revising their materials, and are committed to ensuring accessibility to Spanish-speaking readers. In the final set of materials, all the "highest demand" activities will be translated into Spanish.

SfA activities that have been translated include the following[4]**:**

- *Assessing Conditions Before and After*: In this activity, participants compare levels of environmental toxins in water, air or soil at two points in time.
- *Averages: Scrutinize the Data*: In this activity, participants learn more about whether communicating with averages tells the story they want to convey about their environmental problems.

[4] Please note that final versions of materials may differ from this list, as SfA is in the process of updating materials.

- *Media talking Points*: In this activity, participants summarize their findings and highlight important statistics using sentence starters for media talking points. Community members are encouraged to use this activity when the group has a key fact to communicate, but they want to polish the message.

Arbor consultants have been equally committed to ensure that our evaluation tools are accessible. We translated two surveys in order to ensure feedback from Spanish-speaking program participants. These include:

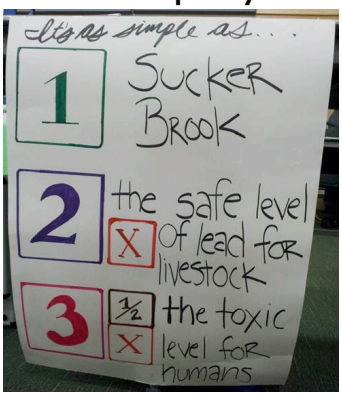
- an activity evaluation form, which individuals filled out after completing an activity led by an environmental organizer, either as part of a community group meeting or as part of an event, such as a conference, training or meeting; and
- a baseline survey for community group members, which was used by LVEJO staff.

Finally, PW translated some of the activities from the SfA soil guide, entitled: Soil Quality Guide: Digging into the Dirt.

- ***EOs in turn use SfA templates and guides to produce their own materials***

EOs further developed materials based on their organization's needs, producing numerous fact sheets, posters and presentations that incorporated SfA learning and approaches. EO capacity to move into this uncharted territory in developing these new materials reflects both a greater understanding of the value of SfA, and staffers' ability to iterate materials based on SfA activities and approaches.

Poster developed by community group in Williston, VT.



Fact sheet developed by community group Safe Strawberry Campaign after a PW SfA training on messaging

Demand Safe Strawberries!

Say NO to Methyl Iodide

Although scientists say it "cannot be used safely," California has approved methyl iodide—a highly toxic, cancer causing chemical—for use in agriculture, particularly on strawberries.

"This is without a question one of the most toxic chemicals on earth." Dr. John Froines, Professor of Environmental Health, UCLA

Methyl iodide causes cancer, late term miscarriages and contaminates water

Scientists use methyl iodide in labs to create cancer cells because it is so effective at causing cancer. In addition to causing miscarriages and groundwater contamination, the pesticide is also linked to neurological problems, but its impacts on the developing brains of children are not known.

Farmworkers and Rural Communities are At High Risk for Exposure

Methyl Iodide becomes a gas when applied and can easily drift from fields onto nearby workers, homes and schools. The exposure levels that California approved as "safe" for workers are 120 times higher than the levels that government scientists say protect against miscarriages and 56 times higher than the levels staff scientists say protect against thyroid cancer.

Corporate pressure trumped science in approving methyl iodide

In December 2010, California officials bowed to pressure from Arysta LifeScience—the largest privately held agrochemical company in the world and manufacturer of methyl iodide—and approved the pesticide, ignoring recommendations of their own scientists and the findings of an independent scientific review committee that methyl iodide could not be used safely.

Support safe, healthy and green agriculture!

Farmers successfully grow strawberries and many other crops organically using ecological practices such as crop rotation and composting. Many growers want to reduce their reliance on pesticides. We need to support them to transition away from the use of pesticides such as methyl iodide.

Ban Methyl Iodide in California and nationally.

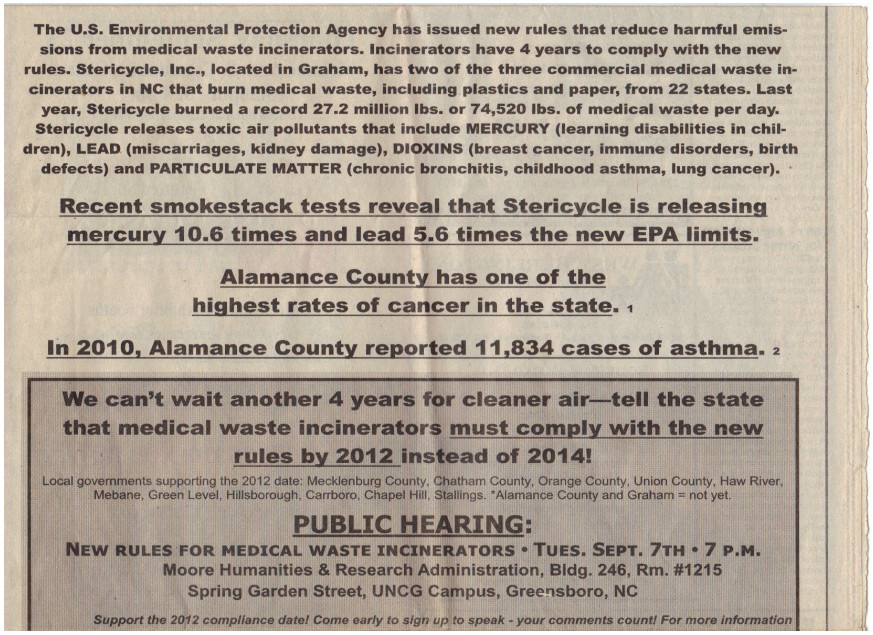
You can make a difference. Take action now!

Visit www.SafeStrawberry.org

Or contact Californians for Pesticide Reform at 415-981-3939 or 1-888-277-4800 (toll free in California)

The Safe Strawberry Campaign is a collaboration founded by Center for Environmental Health, Pesticide Action Network North America and Pesticide Watch Education Fund, all members of the statewide coalition Californians for Pesticide Reform.

BREDL's numeracy–rich announcement about emissions from a medical waste incinerator in North Carolina



The U.S. Environmental Protection Agency has issued new rules that reduce harmful emissions from medical waste incinerators. Incinerators have 4 years to comply with the new rules. Stericycle, Inc., located in Graham, has two of the three commercial medical waste incinerators in NC that burn medical waste, including plastics and paper, from 22 states. Last year, Stericycle burned a record 27.2 million lbs. or 74,520 lbs. of medical waste per day. Stericycle releases toxic air pollutants that include MERCURY (learning disabilities in children), LEAD (miscarriages, kidney damage), DIOXINS (breast cancer, immune disorders, birth defects) and PARTICULATE MATTER (chronic bronchitis, childhood asthma, lung cancer).

Recent smokestack tests reveal that Stericycle is releasing mercury 10.6 times and lead 5.6 times the new EPA limits.

Alamance County has one of the highest rates of cancer in the state. 1

In 2010, Alamance County reported 11,834 cases of asthma. 2

We can't wait another 4 years for cleaner air—tell the state that medical waste incinerators must comply with the new rules by 2012 instead of 2014!

Local governments supporting the 2012 date: Mecklenburg County, Chatham County, Orange County, Union County, Haw River, Mebane, Green Level, Hillsborough, Carrboro, Chapel Hill, Stallings. *Alamance County and Graham = not yet.

PUBLIC HEARING:

NEW RULES FOR MEDICAL WASTE INCINERATORS • TUES. SEPT. 7TH • 7 P.M.

Moore Humanities & Research Administration, Bldg. 246, Rm. #1215

Spring Garden Street, UNCG Campus, Greensboro, NC

Support the 2012 compliance date! Come early to sign up to speak - your comments count! For more information

- ***Challenges***

TERC's close collaboration with EOs has yielded highly adapted materials that TERC's four EO partners use readily. According to TERC staff, a tension exists, however, between the development of customized materials for collaborating EOs and the production of materials that have broader, overarching utility. TERC's testing of materials with other partners and collaborators in a wide range of settings is in part designed to address this challenge (See below TERC's Response to EO Challenges and Other Project Adaptations).

- ***Concern by TAC "veterans" that new staff is not as engaged in SfA***

While they remain committed to implementing SfA, a couple of the "veteran" TAC organizers who were involved with SfA from its inception expressed concerned that new staffers may not have their same level of connection and commitment to the project. Sylvia Broude, the organization's Director, has been involved in SfA from the very start, and has experienced an impressive journey with SfA, from initially being resistant to completely embracing the value of math-rich approaches to environmental organizing. Under her watch and that of her predecessor, TAC staffers have incorporated SfA material into the set of workshops offered to community groups, and organizers have become adept at employing a few of the SfA activities into their work with community groups. Furthermore, TAC's website now highlights SfA and its many resources (see Section 10 on Institutionalizing SfA).

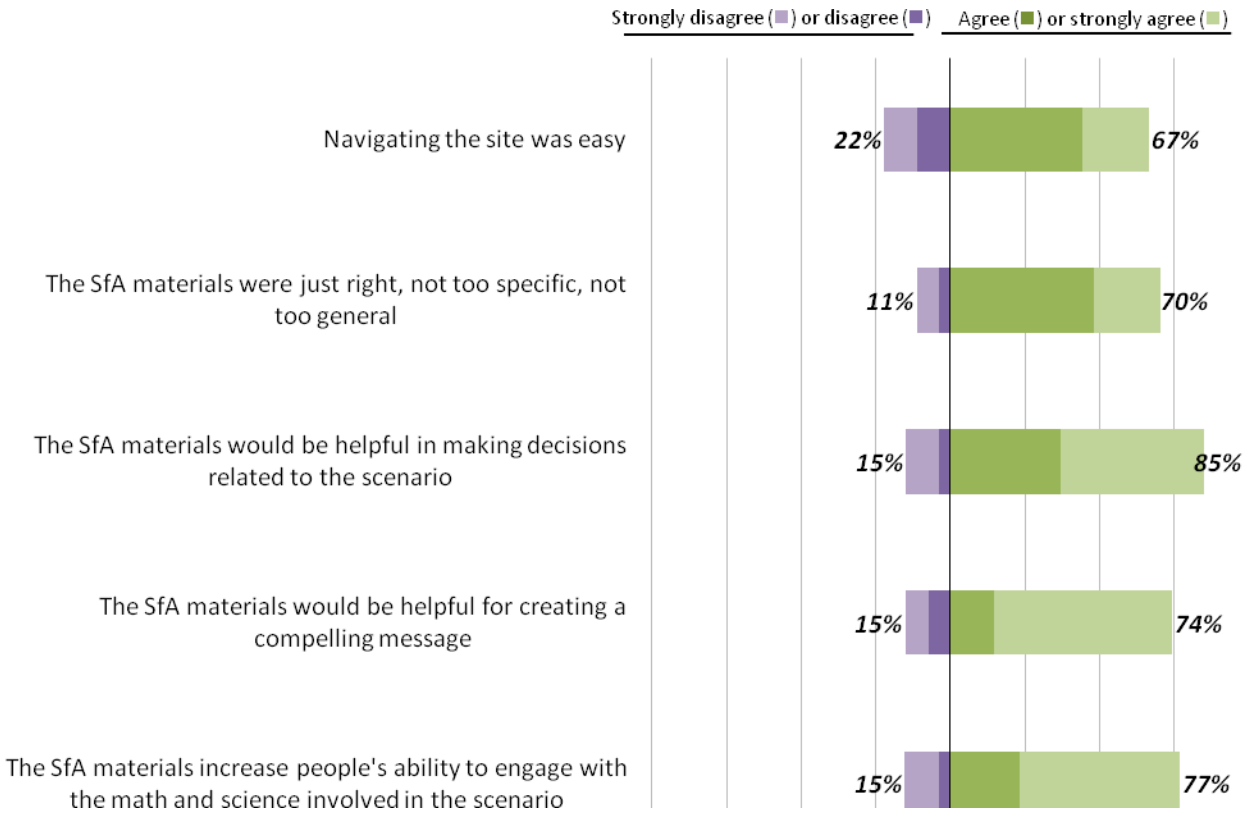
Broude recognizes that "the project wouldn't have come to be without our scenarios". Nonetheless, she says, staff turnover is typical in the nonprofit sector, which creates challenges for those who have participated in SfA from the beginning and believe deeply in its efficacy. "New staff", state Broude, "have no sense of ownership in the project. The older staff who participated know (TERC staff), but when new people come on, they don't have this historical reference/experience". As an example of this, Broude says that, despite training provided to new staff in using SfA materials, new employees refer to SfA as "they", instead of "we", in contrast to staff who have been at TAC either since the inception of SfA, or during its first two years, who feel they are part of SfA. While Broude raises this as a challenge, she still sees TERC as thought partners even in addressing this conundrum. She believes that one way to build more buy-in among new staff would be for TERC to acknowledge TAC's contribution and engagement more front-and-center in its documentation and TERC is open to figuring out ways to do this. As a testament to their responsiveness to input, TERC staff continues to respond to EO comments and criticisms.

3. Community Leaders in Partners' Networks Give High Marks to SfA Materials' Relevance and Utility

In order to assess the utility of SfA materials that are accessible online, TERC reached out to gather additional feedback from EO partners as well as from environmental organizers and formerly active community leaders in partners' networks. In all, twenty-seven people reviewed materials housed on the SfA website through an online survey administered between January and July 2012. Reviewers were asked to select one of three scenarios describing a challenge related to environmental science or data that might arise in the context of their environmental organizing. Two scenarios were provided in the survey. Respondents created their own scenario as a third option. Reviewers were then asked to assess the value of web-housed resources in addressing the problem framed in the scenario they selected.

Summary results below show that large shares of respondents judged the materials to be at an appropriate level of specificity (70%) and useful for making decisions related to the scenario they selected (85%). A large majority also reported that the materials would be useful in creating a compelling message (74%). A smaller share of respondents agreed that the site was easy to navigate (67%).

Figure 1.
Reviewer Ratings of Scenario Features and Aspects (N=27)



Reviewers were also asked to assess a cross-section of SfA materials: two guides, two videos and three activities. As described in Figures 2-4 below, a majority of reviewers reported that the SfA activity they chose would contribute to gains in participants' knowledge as well as provide "advice or information that could influence a campaign." A majority of reviewers of videos reported that they personally gained new knowledge from the video they viewed and reported receiving advice or information that might influence their choices. Finally, a large majority of reviewers of the guides reported that they personally gained new knowledge from the resource they selected.

Figure 2.
Share of Activity Reviewers Who Felt Participants Would Gain Knowledge, Interest, Advice or Information (N=61)

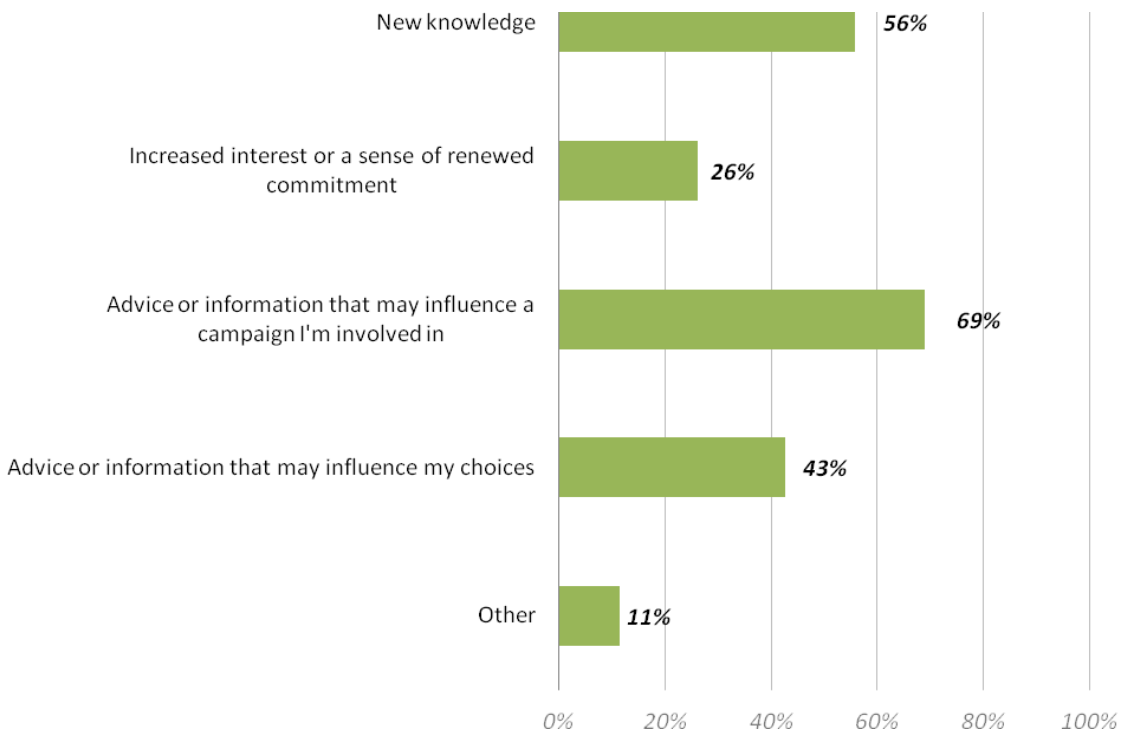


Figure 3.
Share of Video Reviewers Who Gained Knowledge, Interest, Advice or Information (N=48)

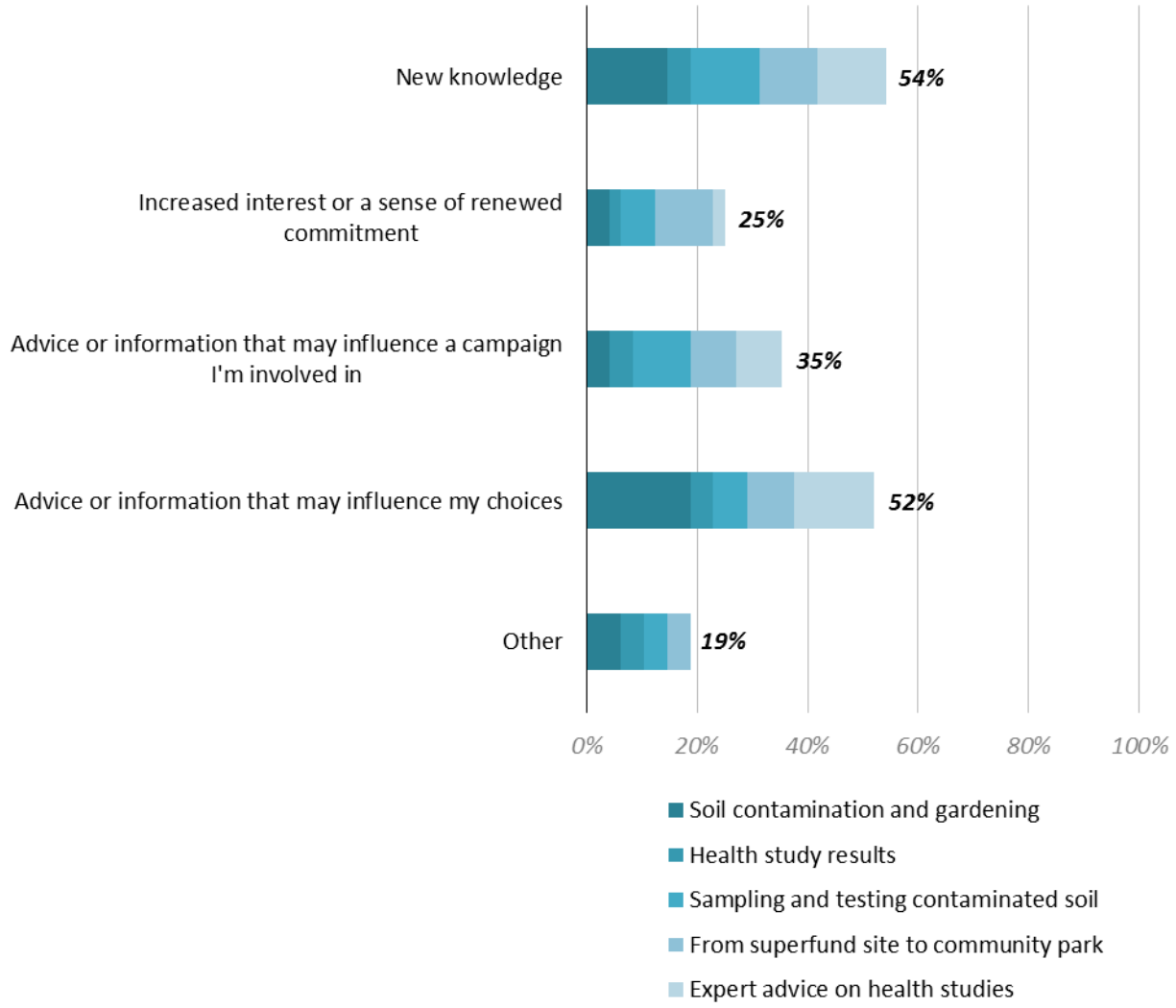
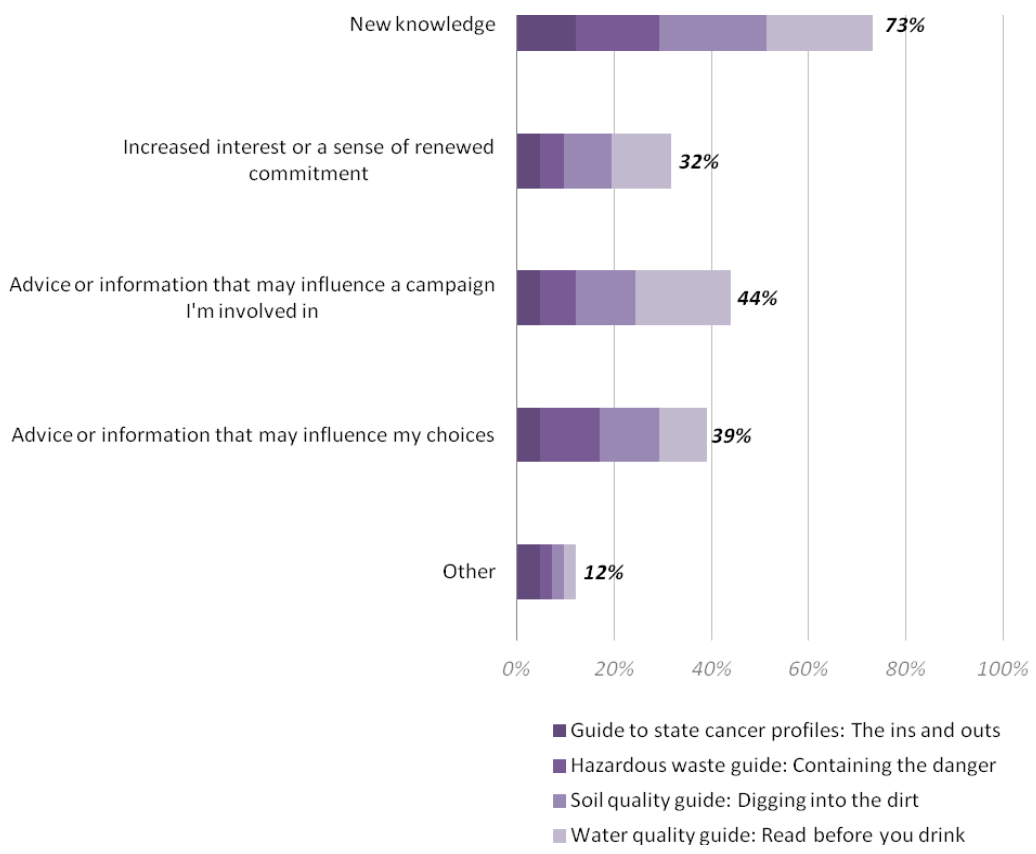


Figure 4.
Share of Guide Reviewers Who Gained Knowledge, Interest, Advice or Information (N=41)



Reviewers' feedback evidenced high levels of interest in the materials and in SfA project goals. Comments related to both activities and guides offered substantial insight into the multiple ways SfA materials might be used across a range of community contexts. Reviewer comments related to SfA Guides include:

In reference to the Guide to State Cancer Profiles:

> *I would recommend this to any individual or group interested in learning about cancer stats for their state --- I would think this would be of real interest to anyone who has cancer or has a family member or friend with cancer, or to any doctor who treats cancer patients. As my dad died of cancer, and because I have a blood disorder that could develop into leukemia, I was really interested in this guide.*

In reference to the Hazardous Waste Guide:

> *If there is an environmental cleanup going on in your area, this is very helpful to stay on top of things. I really like how it emphasizes the fact that just because the EPA might be involved, it doesn't mean that the job is getting done right. This is a very important point.*

In reference to the Water Quality Guide:

> *This would have been extremely helpful in my current fight. It addresses pretty much everything that I had to learn regarding water quality and testing. If there is a company near you that you feel is polluting a water body or drinking water, this is a fantastic starting point to bring a community up to speed very quickly.*

Reviewer comments related to SfA activities include:

> *I would recommend this to a group that needs to be empowered to ask more directed, educated questions to a potential polluter.*

> *This is a very simple 'getting your feet wet' activity that will help people conceptualize the importance of framing data for advancing public discourse.*

As part of their feedback, reviewers named people/organizations whom they thought could benefit from materials produced through SfA that are available online. TERC is now reaching out to the over forty entities that were identified through this process. Reviewers' suggestions for improving the materials have also informed TERC's continuing development and refinement of SfA resources. For example, a recent revision to the SfA resource "Risk: Points of Contact" addresses this reviewer's observation by replacing a ranking activity with 1 being the highest risk, to a rating activity with 10 being the highest risk.

> *Maybe add some personal action risks, such as smoking, to the list they rank. I think you should introduce probabilities of something happening instead of just ranking 'risks'. In fact, I found it a bit confusing to have high numbers, e.g., 10, associated with low risks.*

Finally, in light of survey results showing that more than one in five reviewers (22%) had difficulty finding materials on the SfA website, TERC staff has made efforts to make the site easier to navigate. Adjustments include changes to *SfA in Action* pages, which now guide visitors to a suite of related materials pertinent to a specific topic or setting.

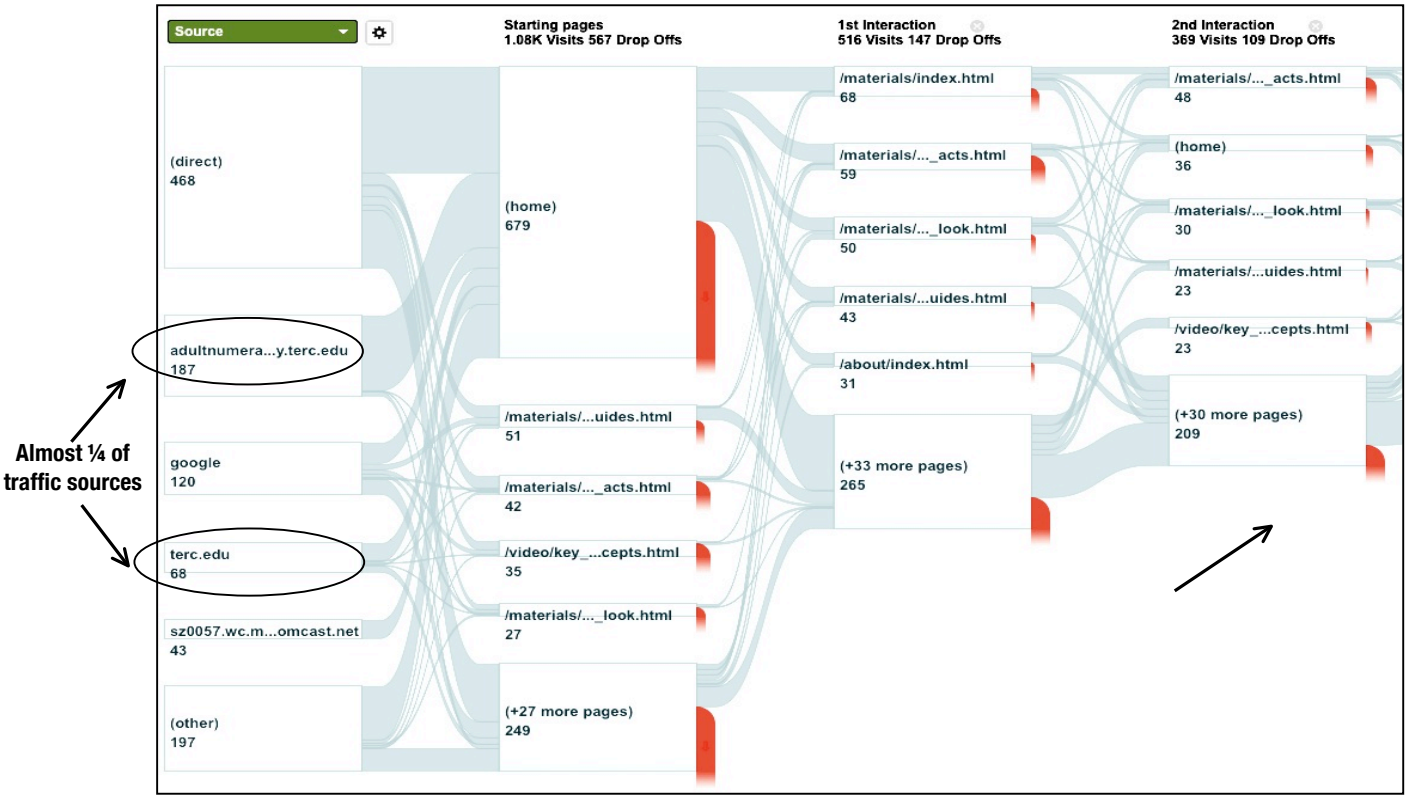
- ***Tracking the use of SfA's website***

While SfA's primary audience was initially focused on EOs, it is evident that its resources have reached a larger audience and have the potential for an even greater reach. One source of

evidence is in data generated regarding visitors to SfA's website. According to TERC's analysis of SfA website traffic, interest in SfA has extended beyond their existing partners to national and international viewers (Figure 5). From April 1, 2011 to March 31, 2012, there were over 1000 visits to the SfA website, and nearly one-quarter found the website through www.terc.edu and the Adult Numeracy Center home page (adultnumeracy.terc.edu). These sites are promoted to and visited heavily by educators rather than environmental organizers.

Moreover, the website appears to intrigue visitors to go beyond an initial look. Of those visitors who arrive, nearly half (48%) proceed to a second page. Retention rates increase as users further explore the site, with 72% of two-page visitors continuing to a third page, and 70% of those proceeding to a fourth page. Close to one-half of all visitors (45%) are return visitors. While the home page is the most common "landing page" for most visitors, more than one-third of visitors enter the website on another SfA page. Beyond that, no single page or pages emerge as a "typical" pathway for users. Instead, more than 20 users selected one of nine different pages as their next choice. Given the power of web-based resources, we believe that SfA's website is well-designed and has the potential for greater utilization among a broad audience.

Figure 5. SfA Website visitor patterns



4. EO Directors' Proactive Stance towards SfA is Critical to Institutionalization

Over the past four years, we have observed that the leadership of all but one of the participating organizations has been very strong in supporting the implementation of SfA. If EOs are to achieve organization-wide implementation of SfA, it is critical that their leadership believe in the assumptions driving SfA and the importance of becoming proficient with its numeracy-rich resources.

As noted earlier, the one organization that lacked leadership buy-in for SfA was LVEJO, where the Executive Director had a hands-off approach, assigning one staffer to work on SfA independently, without any input or involvement from the Director. While this circumstance allowed the staffer to "go with it" in terms of her creative application of SfA, there was no attempt to institutionalize SfA into LVEJO. This level of application would have required buy-in from leadership and a systematic effort to implement SfA organization-wide. In reflecting on her lack of engagement with the project, the Executive Director boldly admitted,

> *There was not enough buy-in from staff because I didn't have enough buy-in. I handed it off to Selene. I realize now that even if the (SfA) approach is great, there has to be entire conversation about commitment. It wasn't fair to Selene to carry it all, and (another staffer) dragged on her end to get (SfA) stuff done.*

In contrast to this lack of engagement from LVEJO, leadership from other participating EOs has been extremely supportive and engaged with SfA. Lou Zeller, the Executive Director of BREDL, believes that "we need to explain better why math learning is important", and values the powerful materials generated by the project.

> *The SfA Facilitators' Manual is an excellent tool because it provides useful guidance in the same way a recipe book does. SfA is also very helpful in deciphering government reports, academic journals and industry documents for our policy work and for community training and education.*

Zeller has promoted the use of SfA in BREDL's recent work on radiation detection and hydro-fracking.

Leadership from PW also fully supported SfA implementation. PW has had two Directors during the period of SfA project implementation. Both saw value in SfA project and promoted the integration of SfA materials into ongoing environmental campaigns. Current Director Mike Somers reflects on how PW has been able to benefit from SfA:

> *I think that helping people understand what is really happening and what the science says about it could be a really big leap forward for environmental organizing. Incorporating the*

workshops from the SfA materials has been a very helpful process for Pesticide Watch. We have been able to work through soil sampling with garden groups and get our central coast methyl iodide groups to think about and message around exposure and safety. I think the thing I like most about the use of the SfA materials is that they are packaged workshops for community groups.

Turnover in nonprofit leadership is not uncommon, as the PW example attests. TAC provides another excellent example of fluctuation in staffing where the commitment to SfA remained constant. In the first year of the project, as mentioned earlier, the then-Executive Director set the bar high for her staff, as she declared after an SfA training that she had had a "eureka experience", and realized the value in understanding numbers to strengthen environmental advocacy work. This Executive Director supported staff to participate in all trainings and technical assistance provided by TERC, incorporated SfA into TAC staff training, and ensured that SfA was being used by organizers in their work with community groups. When she left the organization, the new Executive Director then took up the mantle for SfA, having worked closely with TERC and having strengthened her own confidence in numeracy and its use in making an environmental case. This new Executive Director worked closely with the Organizing Director, who had been involved with SfA from the start, and who is now TAC's current Executive Director. Each person in leadership believed in the value and importance of SfA, and when she left the leadership role, passed on that commitment to her successor.

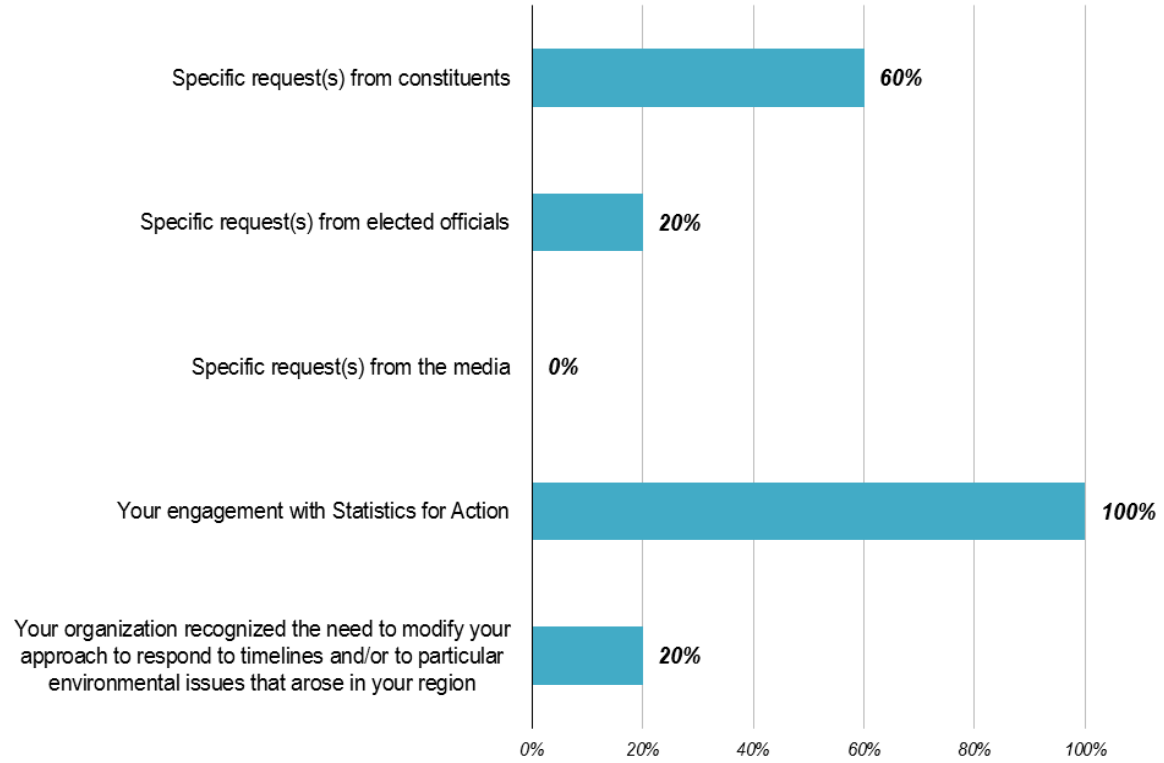
Reflecting on her personal journey with SfA, Sylvia Broude, the current Executive Director, comments:

I've had a small but fundamental shift in my orientation in thinking about and telling the stories of the campaign that we're working on. For example, frequently now, in reading an article about toxic problems, I come cross a fact and I think WOW, that's a great way to describe the problem using numbers or an analogy and it's really compelling, and I think that in general, figuring out how to describe problems and solutions when it comes to pollution and environmental health using numbers and coming up with powerful messages and powerful details to help flush out the story is helpful for campaigns.

In addition to qualitative research focused on EO Director engagement with SfA, Arbor consultants administered a survey to all partner EO Directors in which we asked Directors to identify factors that have motivated a change in their organizational approach to math/science content in their environmental organizing. ALL Directors cited their involvement in SfA as a factor; and 60% cited specific requests from constituents, a testament to EO responsiveness to grassroots needs.[5]

[5] In all, 5 Directors were surveyed: one Director for TAC, BREDL and LVEJO and two PW Directors who were exposed to the project.

Figure 6.
Factors Motivating a Change in Approach to Math/Science Content (N=5)



One director summarized the strengths of *SfA*-generated content in the following way:

> *The SfA Facilitators' Manual is an excellent tool because it provides useful guidance in the same way a recipe book does…The staff at TERC are some of the most helpful and dedicated I have ever met. And friendly, too! Hats off to an excellent crew.*

5. SfA Makes an Impact on EO Staff's Knowledge, Skills and Strategies

The goal of SfA is to provide resources as well as training and technical assistance to environmental organizers so that they can readily incorporate informal math into their organizing work with community groups. Initial SfA trainings for EOs staffers established a common vocabulary and a broad set of approaches that are now reflected in the SfA Manual. Training offered through SfA was then combined with continuing hands-on support from TERC, including opportunities for organizers to trouble shoot strategies for incorporating numeracy rich materials and approaches in their work, and collaborative opportunities to pose questions

and share promising practices with peers. Together these interventions were designed to spark and support staffers' learning and growth.

Over the course of project implementation, Arbor has documented SfA's impact on EO staffers in regular annual reports. In this final report, we draw upon our earlier findings and summarize the impact of the project on staffers' trajectories in the following areas:

- knowledge of key SfA principles and approaches and how to apply these in environmental organizing work;
- skills needed to incorporate numbers and statistics into work with community groups;
- utilization of SfA materials and approaches in their work with community groups as well as in other settings.

- ***SfA Impact on EO Staffers' Knowledge of Math and Science Content in Environmental Organizing***

Qualitative research, combined with the results of annual surveys administered to EO staffers, offers ample evidence of knowledge gains among environmental organizers who have been exposed to SfA.

In interviews and focus groups, several organizers described their transition from relatively low levels of knowledge and dependence on others for help in interpreting math and science content to a higher level of competence and self-reliance. One BREDL organizer offered this comment in 2010 after 6 months of exposure to SfA:

> *I used to look to our Executive Director for help, if I could. Otherwise I would take the figures [in technical reports] and just assume that they were correct. I couldn't really explain anything. If anybody asked me a probing question, I would pass… But now, the [SfA] manual has helped me to understand so that I can explain it other people. It's still hard. It's not easy for me. But I can do it.*

Two years later in 2012, this same BREDL organizer reported:

> *The change is dramatic. Before, I stayed away from math and science facts. As far as trying to explain the numbers [in test results], I didn't feel qualified. I was afraid of making a mistake that would hurt the campaign. Now it's sort of the opposite. I go into it seeking out math and science facts to show why this may be a problem and to educate [community members] and alert the press. I deal directly with reporters now. I'll put together a press advisory and send it. Sometimes they'll use it word for word!*

In addition, many staffers, including this PW organizer, reported increased knowledge and, as a result, greater confidence working with math and statistics in environmental organizing:

> *SfA added to our tool chest in working with and starting campaigns, and allowed me to feel more confident in dealing with some of the scientific stuff – in developing messaging – so not just campaign rhetoric. We're actually developing messaging around scientific fact – to interpret it and translate it for people in the community so everyone understands.*

TAC staffers also described their increased knowledge and comfort with SfA materials over the four years they participated in the project. In 2009, the then-director of the organization said "SfA really clicked for me" during the SfA Advisory Committee meeting. She was able to see how she could use equations to assess risk and caution, and that this totally "demystified the work" TAC had been doing. Commenting that she thought SfA could help her be "smarter and better" at her job, she said she felt "embarrassed" that a toxic action advocacy group didn't have this understanding already. Her comments set the bar high, and other staffers said that while "light bulbs" hadn't gone off so far, they hoped they would. At the time, all of the staff agreed with the director, and one staffer commented that she felt "intellectually lazy". That staffer is now the director of TAC, and this year, when she reflected on her progress in understanding and using SfA, she said,

> *Now I notice on a daily basis the effective use of these types of facts and messages in the work we do, and I also believe more in the need to have people be able to sift through a set of facts and come up with the most powerful one to use to tell their story. I do feel I have had a basic shift in my orientation toward this stuff because of the project.*

Another TAC staffer, who came into the project in its second year, after other TAC staffers had a year of experience with SfA, commented:

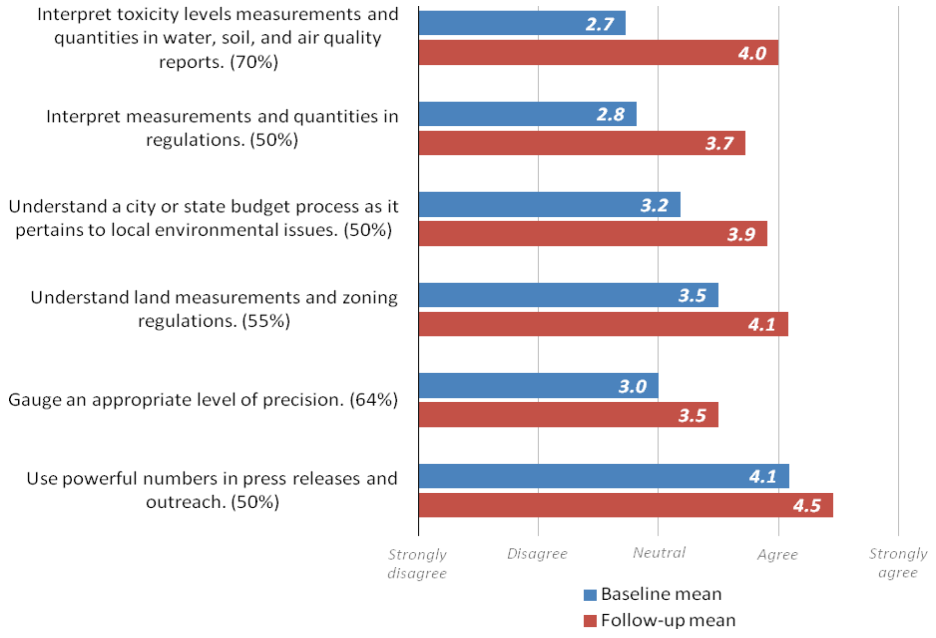
> *When I think back to 3 ½ years ago, when it started and I was brand new to TAC and SfA, I was thinking about it in an academic context. Math and science are not my strong suit, and it felt kind of overwhelming. But the project and the activities and tools coming out of it have evolved to feel more like these are separate tools in our toolbox. Part of that is me growing up professionally as an organizer. It felt less like this compartmentalized thing that's not my strong suit to something that just makes sense to work in.*

Annual surveys to EO staffers have confirmed knowledge gains. Surveys administered over four years show increases in staffer knowledge across a range of topics and issues. Results also offer some insight into changes in the kinds of knowledge that organizers have acquired over time.

Figure 7 below describes the difference between mean baseline and follow up ratings on staff knowledge about topics and issues addressed through SfA. Results show that the greatest areas of increase for the majority of staffers[6] between baseline and follow up include "interpreting toxicity levels measurements and quantities in water, soil, and air quality reports," "interpreting measurements and quantities in regulations," and "understanding a city or state budget process as it pertains to local environmental issues." In Years 2 and 3, by contrast, outstanding areas of increased knowledge for organizers documented through follow-up surveys included basic skills such as "understanding data collection and sample size," "verifying that results are reasonable." We believe that this shift is an indication of organizers' increasingly active use of SfA in specific community or campaign contexts. One BREDL staffer put it this way:

> *We now use SfA to help us answer pressing community questions. For example, understanding levels of toxins in soil samples taken in communities located near a steel galvanizing plant.*

Figure 7.
Mean Baseline and Follow-Up Ratings of Knowledge of Math and Science Content (N=11)



[6] [1] Over the course of the evaluation, we interviewed 11organizers, held 8 focus groups, and collected baseline and/or follow-up surveys from 23 EO staffers. In order to report on changes, we selected a sub-sample for which we had both baseline and follow up survey, despite staff turnover over the course of the project. In all, responses from 5 TAC staffers, 2 BREDL staffers, 3 LVEJO staffers and 1 PW staffer are included in these results.

Note: Percentages represent the share of staff respondents who provided higher ratings of their math and science knowledge at the follow-up than at the baseline.

- ***SfA Impact on EO Staffers' Skills***

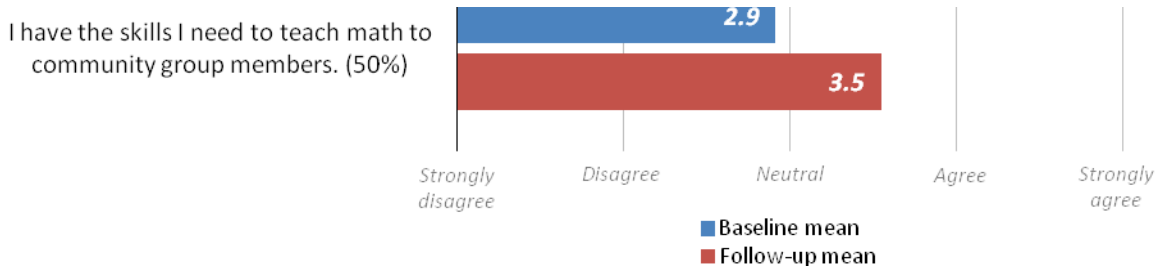
Boosting organizers' ability to apply new knowledge is a paramount objective of SfA. Not surprisingly, skills gains have followed upon knowledge gains in a tiered fashion, as organizers test what they have learned in the field.

Results of interviews and focus groups with EOs staffers, in addition to material review and participant observation of organizers in community contexts, confirmed that staffers' skills have improved over time. One TAC staffer said that in her work with community group members,

> *There's been a shift (in me) to challenge numbers and challenge stats, rather than to steer community group members away from statistics, away from hard or boring numbers, to not get people into a messaging battle that we're going to lose, but (instead) to be able to come up with the numbers that (help us) go up against the opposition".*

Results of survey research during the period of project implementation are in line with our qualitative findings. A majority of organizers now engaged through the project report that they have the skills they need to teach math to community group members (see below Figure 8). Notably, mean staff ratings start at below the neutral rating on the baseline, and moved to a positive rating at the follow up. This means that, in addition to some staffers who improved their already strong skills, many staffers who reported no skill or limited skills at baseline now have the skills they feel they need to do this work.

Figure 8.
Mean Baseline and Follow-Up Ratings of Skill at Teaching Math to Community Groups (N=11)



Note: Percentage represents the share of staff respondents who provided a higher rating of their skills at teaching math at the follow-up than at the baseline.

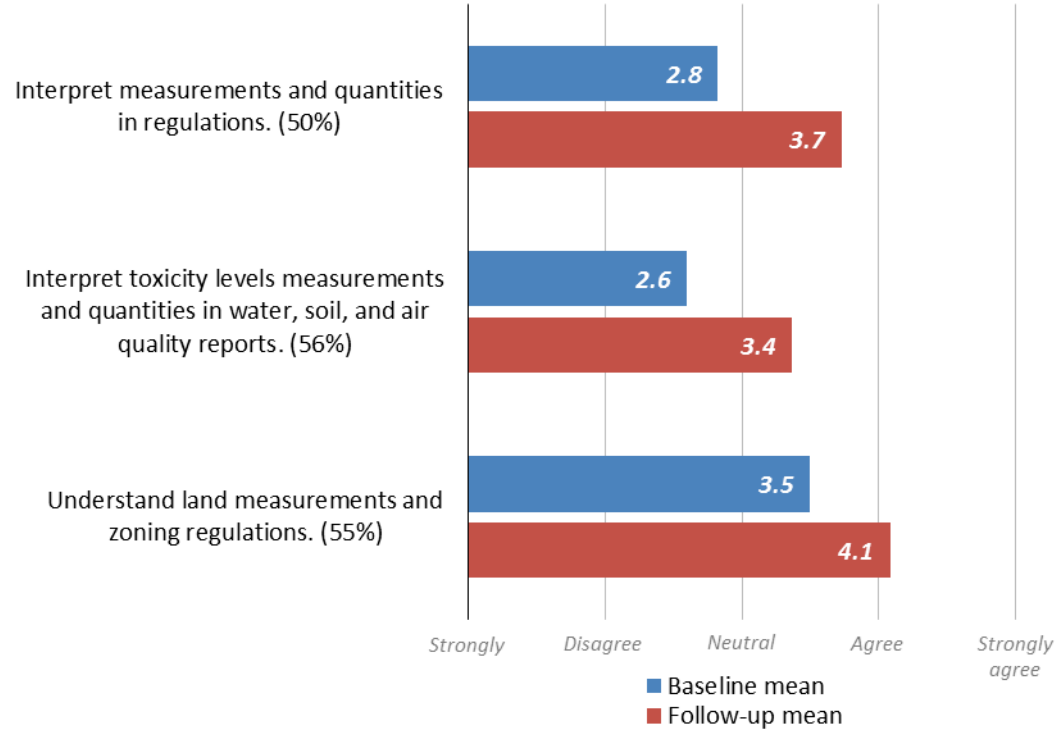
Survey results also suggest that for most EOs, skill development is happening in areas which are relevant to the practical organizing work that EO staffers are undertaking with community

groups. For example, when a school in Sacramento, California, wanted to create an organic garden and needed to know about the soil health, PW showed school staff the SfA website and walked through the soil testing guide. Then PW hosted a mapping exercise with 20 community members who created a map of hot spots, then tested the soil and sent off results. PW's current plan is to work with the group to understand results and develop a fact sheet, posters, and Power Point presentation. Observes a lead PW organizer,

> *I tended to gloss over these issues before because they overwhelmed community members. Now I have a set of tools to address sorting out numbers, messaging, figuring out how to make sense of data and communicate risk.*

Results described in Figure 9 below indicate that skills improved for a majority of organizers in the same or related topic areas as knowledge gains referred to above. In relation to two items, "interpreting measurements and quantities in regulations" and "interpreting toxicity levels measurements and quantities in water, soil, and air quality reports," mean staff ratings start at below the neutral rating on the baseline, and moved to a positive rating at follow up. Again, this indicates that, in addition to some staffers who improved their already strong skills, many staffers who reported no skill or limited skills at baseline now have positive skills in these areas.

Figure 9.
Mean Baseline and Follow-Up Ratings of Skills in Communicating Math and Science Content to Community Members (N=11)

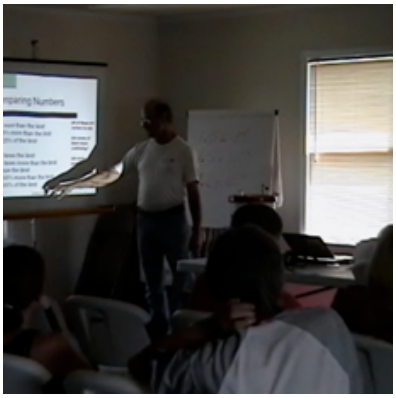


Note: Percentages represent the share of staff respondents who provided higher ratings of their math and science skills at the follow-up than at the baseline.

- ***Impact of SfA on EO Staffers' Practice with Community Groups***

Prior to their engagement with SfA, most EO staffers encountered math and statistics in their work but were less likely to incorporate numeracy-rich materials and approaches in their environmental organizing. Building on deeper knowledge and stronger skills gained through SfA, staffers have shifted their practice with community groups. As noted earlier, TAC consultations with community groups now include an SfA-inspired module on "Interpreting Test Results".

BREDL's Lou Zeller introduces Chapter members to SfA



BREDL organizers regularly advise the leaders of new Chapters to create fact sheets using "friendly numbers" that community members can readily understand and remember. This was BREDL's advice to the leader of the new BREDL Chapter SAFE Carolina, a North Carolina group concerned about nuclear energy. The leader of this Chapter has committed to work with her group to follow this advice. PW added math and science consultation workshops to their repertoire, expanding the available resources they can offer to community groups. Now when they work with community groups, math and science content is routinely incorporated into their workshops. LVEJO's key staffer who used SfA materials was inspired to incorporate numeracy-rich activities into her work with community members.

For TAC organizers, their route to this level of application began with support for groups like the Coalition for Clean Air in Somerset, Massachusetts that fought to close down a century-old coal-burning power plan in their small, primarily Caucasian community of 6,000 households. Working closely with TERC, TAC organizers tested their ability to make SfA useful and relevant to Coalition members in the context of the Coalition's environmental campaign, particularly at a moment in the campaign when Coalition members were struggling to communicate the science and health impacts of the power plant.

Silvia Broude introduces"Memorable Messages"

At one of the Coalition's regular meetings, for example, Sylvia Broude, who was Organizing Director at the time, worked with TERC staff to introduce the SfA activity

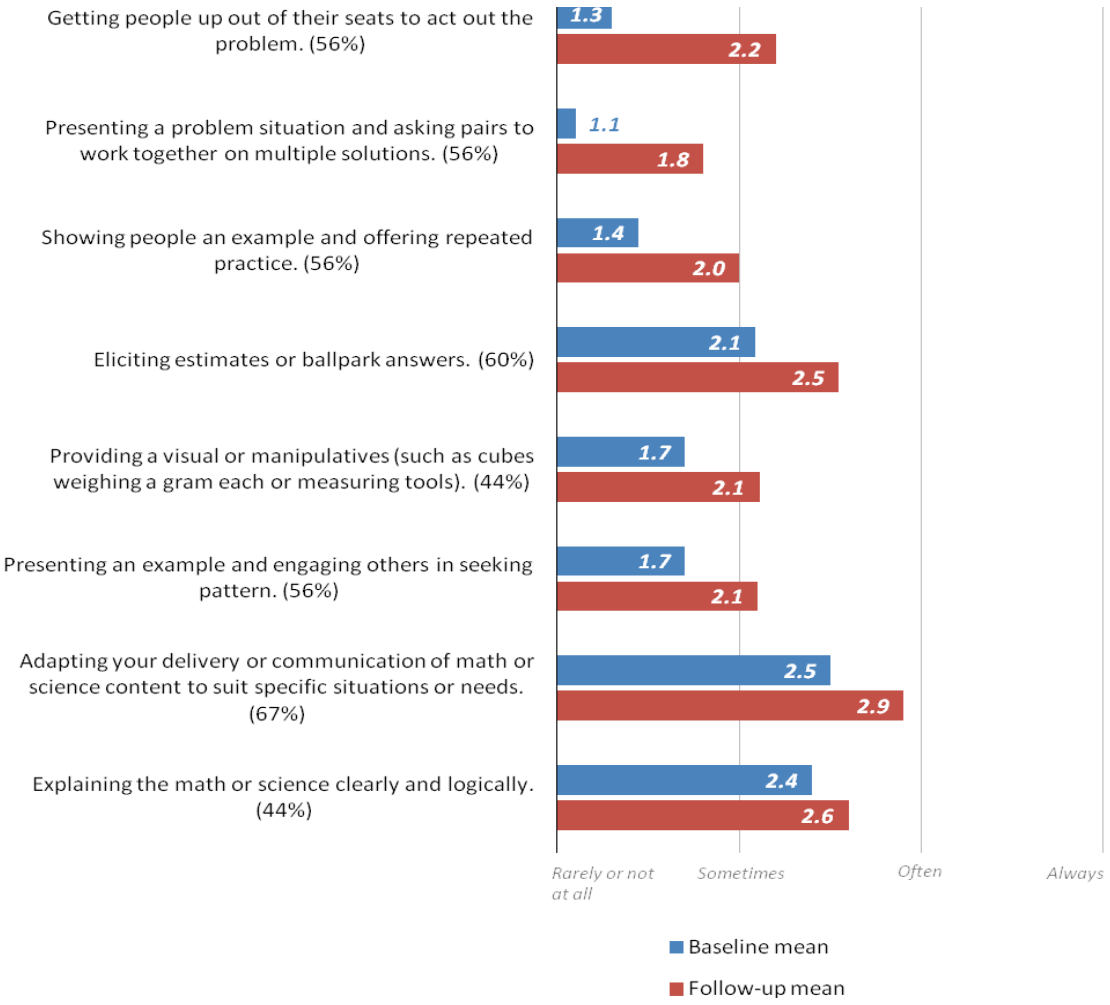
"Memorable Messages," using data from the BP Oil Spill to illustrate why it is important to work with numbers. Broude then led the SfA activity, "A First Look at Technical Documents", introducing an EPA letter, 10 years of Toxic Release Inventory (TRI) data from the Environmental Protection Agency, power production capacity information put together by the Conservation Law Foundation, and real estate and personal property tax data from the city of Somerset. In a focus group conducted after this meeting, community group members said that despite their initial fears that they wouldn't understand the data, they felt more confident and were enthusiastic about SfA as a resource to move their campaign forward.

Reflecting upon their early experience in Somerset and her own personal journey with SfA, Sylvia Broude, now TAC's Director, commented:

> *My general orientation before this project was that those sorts of fact and figures – we don't really want to tell those in our story, people don't understand them, we don't have the tools to understand them and I'm going to rely on an expert to come up with the relevant facts we need to get our message across. Now I notice on a daily basis the effective use of these types of facts and messages in the work we do, and I also believe more in the need to have people be able to sift through a set of facts and come up with the most powerful one to use to tell their story. I do feel I have had a basic shift in my orientation toward this stuff because of the project.*

Arbor research also confirmed that EO staffers are increasingly using pedagogical approaches recommended by SfA in their work with community groups. Figure 10 below describes EO staffers' responses to a survey question about their math-related teaching strategies. At follow up, all EO staffers reported a change in the strategies they would use with community groups, with a tendency toward increased diversification of teaching techniques and a shift toward hands-on approaches.

Figure 10.
Average Extent to Which Staff Used Specific Teaching Strategies at the Baseline and Follow-Up (N=11)



Note: Percentages represent the share of staff respondents who indicated using the teaching strategy with greater frequency at the follow-up than at the baseline.

This shift in teaching strategies reflects EO staffers growth' as well as community members' willingness to work in new ways. SfA requires EO staffers to more deeply explore the math and statistics relevant to a campaign, but this approach was not always welcome. According to one PW organizer,

> *Facts can provide the basis for motivating people to action but they RARELY if ever win political contests. Sometimes this is frustrating to community members who want to just focus on the facts and not incorporate messaging or strategy into their use of the facts. The SfA materials show the*

importance of working through this challenge to interpret and communicate with numbers effectively."

- ***Factors Affecting Individual EO Staffer Trajectories***

As group, EO staffers have experienced important gains in numeracy-related knowledge and skills and have shifted their organizing practice. Individual trajectories vary, however. Our research shows that no single factor is determinative; rather staffer outcomes have been shaped by a combination of factors. Among them:

- ***Exposure to SfA.*** Because of the nature of SfA's gradual incorporation of new environmental organizations, EO staffers were exposed to SfA at differential "doses". Some TAC staffers were exposed to SfA over the entire four years while BREDL, PW and LVEJO staffers who entered the project in Year 3 were exposed to SfA for only two years. Staff turnover also affected dosage. For example, of the five TAC staffers who completed baseline and follow-up surveys, two have been working for the organization for the entire four years of the project; three have only been exposed to SfA for two years, and one of those staffers is no longer working for TAC. The pattern is similar for organizations that joined the project in Year 2. Of three BREDL staffers who completed baseline and follow up surveys, two organizers have been exposed to SfA for the full period of BREDL engagement and the third organizer for only the last year. As described earlier, exposure for LVEJO staff is even more inconsistent, given the organization's major lay-off during the period of SfA implementation. As mentioned earlier, while the main staffer introduced to SfA lost her job in the organization's second year with the project, she continued to work with TERC and therefore was able to provide baseline and follow-up data for the evaluation. In addition, in Year 4, one new LVEJO staffer began to use SfA, but lacked exposure to all-partner meetings and the SfA Advisory Committee meetings. During the two years that PW was exposed to SfA, there was a change in staffing and in the leadership of this small organization of only three staff. The key to continuity for SfA engagement at PW was one long-standing staff person, who trained both the new director and staffer in the how to use the SfA manual with pesticide groups.

- ***EO structure and strategy.*** As noted earlier, the organizational structure of environmental organizations, in concert with their strategic approach in working with community groups, combined to affect the extent to which EO staffers implement SfA with community groups. EOs such as TAC and PW which incorporated SfA into regular consultations and workshops with community members provided organizers with repeated opportunities to practice SfA approaches and deepen their learning on a broader range of topics.

- ***Nature of environmental campaigns.*** Grassroots environmental campaigns differ in the degree to which SfA materials and approaches are immediately relevant. This in turn affects the number of opportunities that organizers have to introduce SfA to community groups and apply what they have learned. Organizers in each of the partner EOs also found that opportunities to introduce SfA were more limited when community groups faced urgent challenges in their campaigns.

- ***First among equals.*** Although EO staffers in all of the partner organizations were mentored and supported in thorough and consistent ways by TERC staff, TAC had the advantage of piloting SfA approaches and co-creating some of the first project materials. This early relationship between TERC and TAC has had a number of positive effects. First, it developed a sense of ownership of the final product among TAC staff; second, it increased TAC's comfort with SfA approaches because they are familiar; and third, it created a sense of pride among TAC staff because so many of the case examples used in SfA materials are based on problems/issues they surfaced from their community groups.

- ***Learn then teach.*** Results of our qualitative research suggest that organizers who had opportunities to train peers in SfA also internalized SfA approached more fully (train the trainer model).

- ***SfA can be time-consuming initially.*** There is also ample evidence that getting "up-to speed" on using SfA can be time-consuming, and even those who see its value and believe in using SfA in their work still experience a learning curve. Organizers' prior experience influences the ease of using numbers and statistics in their work, but invariably, there are new skills to be learned by all organizers in the project. One TAC staffer comments that "messaging with numbers is pretty easy, the analogies work for me. Anything I've done before, I can do again, for but for something I've never done before, it takes a while to prep for, especially to get numbers or to sift through reports to get them to a bite-sized piece". Moreover, some organizers say that preparing to use SfA requires getting the right facts for the exercises, which can be time-consuming. The TAC Director says that organizers do a lot of preparation in advance of running their workshops, possibly spending as much time on prep as at the meeting: "It's hard to do it (with SfA). We need to make sure we have the right raw data to start with, something that will be rich enough to pull out the right facts, or the messages we want to come up with for messaging with numbers, or coming up with an analogy. It's important to have good ideas coming in as samples, to get the juices flowing (among community group members)".

- ***Peer-learning.*** Our research suggests that organizers benefitted from sharing stories and lessons learned with their peers within their own organization. For example, TAC organizers incorporate SfA into their trainings with new staff, provide opportunities for these staffers to use SfA with community group members, provide coaching and technical assistance throughout the process, and de-brief after staffers have facilitated the use of SfA exercises with community group members.

- ***Value of Advisory Committee members and other EOs.*** Organizers benefitted as well from their interactions with project advisors and the members of other EOs. One BREDL organizer recalled a first face-to-face meeting of partners and advisors organized by TERC and facilitated by TAC:

> *At that workshop in Boston, we were all working together, all still struggling. That changed the way I looked at it. I realized that others were struggling just like me and that despite this, we were all committed to learning more. That was my epiphany. I realized then that [SfA] is not part of my work but it had to be.*

Sylvia Broude, TAC's Director, also reflected on the importance of Advisory Committee meetings, saying that the meetings were timed when their staff were learning about the SfA toolbox, and "helped to institutionalize the project".

Although one of our initial hypotheses was that the level of EO staff learning and application of SfA would be affected by staffers attitudes toward math, results of our survey research show that scores measuring how much an individual staffer "liked" math changed little during the period of her/his exposure to the project. As noted earlier, staffer's knowledge and skills related to math and statistics did shift measurably over the course of the project, however.

- **Challenges**

TERC and EOs come from very different worlds. In TERC's world, the work of teaching about numbers and statistics involves slowing down and contextualizing the learning. In contrast, the EO world is fast paced, often driven by environmental crises. Additionally, many organizers see themselves as resources not as math literacy educators. Ultimately, TERC staff and EO organizers did accommodate each other's priorities and ways of working, and forged a positive collaboration, but, for some organizers, this took time and energy.

One TAC organizer says that from her "birds-eye view, our relationship with TERC has only improved. I feel really good about it". As an example, she said that when one of the organizers was out with food poisoning, a TERC staffer and another TAC organizer "swooped in" to work with the community group in Somerset.

It just feels like a team effort! And we're all working towards a common goal and so I think that is great.

And another TAC staffer commented:

I think that there was an initial culture clash between the educators and the organizers, but I think we really have learned to work together quite well… And I think on both sides, from TERC's end and from our end, the (work of putting SfA) into context…has just gotten better. So there are still bumps in the road, but I think there's been a huge improvement.

Challenge to EO implementation of SfA as originally envisaged. Due to the nature of their work with community groups and/or the evolution of specific environmental campaigns, many EO staffers could not implement SfA with community groups in the sustained and systematic manner originally envisaged in the SfA Logic Model. When this challenge to project implementation became apparent, TERC worked with EO partners to adapt their approach. As described in greater detail below, TERC ultimately encouraged environmental organizers to deploy elements of the SfA toolkit selectively in a broader range of circumstances, as opportunities arose. As one TAC organizer said,

We transitioned the (SfA) model from pitching (SfA to) pilot groups to figuring out more holistically where SfA can fit in.

EO transition to greater autonomy. While TERC's support for EO staffer growth and learning has been exemplary, it is equally important that staffers become more autonomous and less reliant on TERC mentoring over time. As might be expected, staffer capacity to initiate and apply SfA independently is uneven both within and across partner EOs. Factors at play include conditions over which staffers may have little control such as their degree of exposure to SfA and the nature of local environmental campaigns.

TAC's longer engagement with TERC and SfA serves it especially well in this instance. TAC organizers have had ample time to develop their skills and confidence in using SfA, both with community groups as well as with their peers, and therefore have been able to wean themselves successfully from dependence on TERC staff. BREDL staffers have developed independent capacity as well, especially in helping community groups craft numeracy rich messages for the public. Due, in part, to strong math and science backgrounds of staff, PW organizers developed an impressive level of confidence in working with the materials early on, and have maintained these skills over time, allowing them to work independently. Currently, they are actively thinking about how they can use more of the SfA manual with new community groups. Finally, LVEJO staffers utilize SfA in a very limited way, incorporating numbers and statistics through their toxic tours. While they are not "dependent" on TERC staff, it is also unclear as to whether they will incorporate more SfA-inspired materials into their work.

6. TERC's Response to EO Challenges and Other Project Adaptations

Overall, TERC staff exhibited an impressive capacity to adapt to the realities of on-the-ground implementation challenges with community groups. In this section, we outline some ways in which TERC responded creatively to EO challenges.

TERC encouraged EOs to use SfA more selectively with community groups

As noted earlier, EOs found that it was often difficult to fully incorporate SfA into campaigns being carried out by community groups with which they collaborated. Organizers initially tried to incorporate SfA into an entire campaign, but for most groups, this was challenging. They discovered, for example, that when community groups were intensively engaged with urgent matters within the campaign, they resisted incorporating a new element to their work. The task of fully incorporating SfA into a campaign was perceived as taking time away from the urgent matters at hand, rather than being perceived as a value-added.

Describing the organization's increased understanding of the issue of timing in working with community groups, one TAC organizer says,

> *We kind of have internal criteria for ourselves in deciding which groups we're going to focus on for the SfA work. We don't pick groups that are in crisis. We just know that groups that are going from public hearing to public hearing are not the groups that we want to be spending time on, that we can pull in this direction in a significant way. (Instead, we choose) the groups where there's a little bit of a lull and they're focused on continuing to build their case, or starting to test to build their case. That makes perfect sense (for SfA). So I think part of (our success with SfA with community groups) is our ability to pick the right groups.*

Likewise, a BREDL organizer commented,

> *Ideally, we would be visiting our Chapters regularly but, practically speaking, we go to who is in most need, who is crying out for help. Every one of us feels stretched. We might have a schedule for the day (that includes SfA) but if some environmental crisis comes up, that gets pushed aside.*

Moreover, the volatility of community group membership often created an obstacle to a full-out implementation of SfA at the community group level. With membership turnover, it was difficult to gain "traction"; that is, it was challenging for a community group to engage in multiple and varied SfA activities over a period of time and with a consistent group of members, which in turn made it difficult for evaluators to administer baseline and follow-up surveys and measure overall impact at the community group level.

Through ongoing dialogue with EOs, TERC staff was informed about the problems organizers were facing in introducing SfA to community groups as a "total package." Just as they adjusted their approach in the process of developing SfA materials, TERC staff responded creatively to accommodate these obstacles. Rather than insisting that SfA be fully implemented with community groups, TERC staff recognized that SfA could be used selectively with community groups, in a more customized manner, with organizers determining the most appropriate SfA activity to advance a community group's needs, both in terms of strengthening their knowledge as well as communicating the most effective messages in their communities. With this strategy in place, TERC staff delved into the panoply of materials they had developed and isolated particular bundles of activities and approaches that could more easily be matched with specific community group efforts. TERC staff also developed a Facilitator's Guide that provided support to environmental organizers in selecting the appropriate set of activities to further a particular element of an organizing initiative.

TERC encouraged EOs to use SfA in venues beyond environmental campaigns

TERC staff also encouraged EOs to find productive ways to maximize utilization of SfA materials and training beyond their work with community groups, including at events, conferences and meetings, and in more public venues that affected broader numbers. This broadened focus allowed EO's to share their knowledge about SfA with other organizers and community activists, strengthening their knowledge and capacity to utilize the range of SfA activities and approaches.

This broadened approach – in which EOs used SfA materials and approaches in a variety of capacities – also "matched" how some EOs operated. For BREDL, this approach was a good fit, as the organization already produced a variety of materials for conferences, testimony and press releases. TAC organizers initially focused their efforts on trying to incorporate SfA into community group campaigns, but had little success. Consequently, they welcomed the support from TERC to broaden their approach to include SfA in other contexts, and staff was ultimately able to utilize SfA materials and approaches in an impressive variety of venues. Similarly, PW and LVEJO adapted to the shift easily.

Because TERC was able to adapt to the on-the-grounds reality, EO staff was acknowledged as "the constant" in the equation, with the goal of building their strengths and proficiency with the language and content of SfA so they could fluidly use SfA resources in a variety of venues.

TERC encouraged a transition from EO dependence on SfA staffers to autonomy in implementing SfA

From the beginning of the project, TERC staffers have had a strong presence working with EOs and to a degree, working in communities, as they modeled the utilization of SfA with community group members. Over the past two years, the evaluation has documented how

TERC staffers were initially perceived as experts and teachers, both by organizers as well as community members, and the importance of "weaning" their engagement so that EOs could ultimately sustain SfA without coaching and technical assistance.

From the inception of the project, TERC staffers have been highly aware of the need to support ultimate EO independence, and this past year, in particular, they have transitioned from providing steady support they once had provided to providing less intensive support. There is significant evidence of organizers' increasing capacity to use SfA materials independently. For example,

- ***TAC:*** TAC organizers have had the longest amount of time participating in the project, and have developed both a strong understanding of the broad range of uses for SfA, as well as strong skills in using SfA materials and approaches. TAC staffers and leadership now recognize the importance of using SfA independently, and have the capacity to do so. Consequently, they have been very successful in weaning themselves from TERC support.
- ***BREDL:*** One of the lead organizers has gradually become more autonomous in her use of SfA and relies less on TERC staffers, but still seeks out TERC staff for advice and regular check-in's.
- ***PW:*** Monthly phone meetings with TERC staffers helped PW organizers develop greater confidence in using SfA materials and approaches, and they report that they are more comfortable talking about math and science and creating effective messaging based on that knowledge. One PW staffer who has been extremely enthusiastic about SfA from the start developed early confidence and independence in using SfA materials. Consequently, she has provided support and mentoring to her co-workers.
- **COCEJ:** A lead organizer with the Coalition of Communities for Environmental Justice (COCEJ) in Mississippi joined SfA relatively late in the game, only cementing the partnership in the fourth and final year of the project. From the start, she was very enthusiastic, and exhibited rapid uptake of SfA concepts and practice, as evidenced in three workshops she prepared for COCEJ, using SfA materials and approaches. While she reports that she is still working to communicate better with numbers, the three Power Point presentations she created reflect a deepening understanding of how to effectively use numbers in helping community members understand environmental problems as well as mobilize for action. Commenting on the partnership, a TERC staffer said he solicited data from this COCEJ organizer to help her plan a recent training. As testament to her capacity to work independently, he said that the presentation she developed "had some SfA-style number help that neither of us (TERC staff) directly coached her on; she seemed to have modeled it based on SfA ideas from previous workshops".

TERC expanded to create new partnerships:
In addition to supporting EOs to broaden their approach to using SfA materials, TERC staff also initiated several new partnerships with interested nonprofit organizations, including the LA EJ Network and the aforementioned COCEJ in Mississippi. Each of these organizations afforded TERC more opportunities to disseminate SfA materials and support its utilization. Furthermore, as described more fully below, TERC staffers sought out opportunities to test the use of *The Change Agent* magazine as an informal math/science educational tool with adult learners, and provided support to organizational leaders to implement this initiative.

Finally, when problems arose with LVEJO, TERC staff made the bold decision to continue working with Selene, the laid-off staffer who had been the singular trainee in SfA materials and training. In sub-contracting to work with her, SfA was able to impact 59 people from three additional nonprofit organizations in separate and struggling Chicago neighborhoods, as well as to further test the impact of *The Change Agent* with 48 adult education students in Chicago. The latter focused on literacy education, in which several classes of adult education students read and discussed *The Change Agent* issue on environmental justice topics, produced collaboratively by TERC and partner EOs. While the responses to all of these training sessions were extraordinarily positive, and organizers from these nonprofits indicated a desire for more training, there is no mechanism to sustain them at this time.

7. SfA makes an impact on community members learning and behavior

In my dream world adults would:

- *know how to read and understand a permit of air or water pollution discharge;*
- *would not be frustrated by looking at state environmental reports and regulations;*
- *be literate in understanding things like Notices of Violations and Complaints Filed in public records – these are the key to getting regulation of existing pollution sources and new permits;*
- *go to public hearings and speak what they know in their hearts - that pollution causes disease.*

Janet Zeller, Founding Director, Blue Ridge Environmental Defense League

Environmental organizers engaged through SfA serve citizens in communities that are disproportionately burdened by toxins, but who are hampered by a limited understanding of measurements and data, such as zoning regulations, permits, and test result reports. A primary objective of EO partners is to equip community members with the means to understand these measurements and data so that they can make informed decisions and use numbers convincingly to communicate with decision makers and others.

As noted in earlier sections of this report, community groups served by EOs are reluctant to participate in SfA-related activities if they take time away from activities needed to address

urgent environmental challenges. But environmental organizers within all EO partners ultimately became adept in inserting SfA-related materials and trainings into group processes, when the right opportunity arose. Each of the EO partners has enjoyed success with this approach and this is reflected in community members' increased engagement with numbers and statistics in the context of their environmental work. Where circumstances have allowed EOs to apply SfA approaches more intensively, adults in community groups have developed new numeracy skills that they are able to deploy independently.

Altogether, over 40 community groups in twelve states have benefitted from SfA materials and activities introduced in workshops and meetings facilitated by partner EOs. Through EO efforts, most of these groups have been introduced to SfA's signature "Smart Math Moves" as well as to one or more of the nearly forty activities outlined in the SfA Facilitators Manual. Many community groups have also taken advantage of step-by-step advice provided in TERC's Soil Quality Guide, Water Quality Guide, Hazardous Waste Guide and Guide to State Cancer Profiles, as well as in SfA videos. Arbor's assessment of the impact of community group members' exposure to these elements of SfA is based on a combination of sources, including interviews with EOs, focus group interviews with community groups, results of a survey distributed to community group members in Years 1 and 2 of the project, and the results of a more recent survey distributed to 187 community group members who participated in SfA activities.

Following are examples of the types of encounters that community group members have had with SfA and how this has affected community group members' numeracy-related skills as well as their advocacy in practice.

- ***BREDL and Citizens for a Healthy Environment***

BREDL organizers report that one of the most successful applications of SfA was with Citizens for a Healthy Environment (CHE) in North Carolina. This BREDL Chapter's activism contributed to the shutdown of a biomedical waste incinerator in Mecklenburg County (Biomedical Waste of North Carolina - BMWNC), although the incinerator later re-opened under another name. As requested by CHE, BREDL staffers attended a meeting of the group in May 2011 to help the six Chapter members determine next steps. The group was concerned about contamination levels near the incinerator since recent soil tests had revealed high dioxin levels in the soil, following the prevailing winds from BMWNC.

At the meeting, BREDL organizers introduced to "Risks: Points of Contact", an SfA activity that gets participants to rank everyday activities that pose various levels of risk of exposure to contamination. Community members then discussed who would be most likely to be exposed to dioxins in the soil and from what type of actions, such as drinking well water, showering, swimming, cleaning and laundry, eating foods from contaminated soil, or being in a building

where the air or soil beneath the building are contaminated. According to one BREDL organizer,

> *Everyone was extremely interested in this exercise and some had not thought much about the different paths of contamination. Many have vegetable gardens and now are thinking about whether they should eat their harvest. For me, this was one of the … most useful SfA activities I have been a part of because it is so relevant to the lives of these good people.*

Initially CHE Chapter members were sobered by what they discovered. One community member commented:

> *I never really thought I would be involved in something like this. I didn't and still don't have a lot of confidence in my knowledge of this stuff. It seemed wrong, but I don't know how to determine what is causing anything - and it's a little overwhelming.*

Another continued,

> *I never really thought about whether I should be eating my own vegetables from my garden. I knew it was a problem, but thought of it as "air" pollution and not "food" pollution. That was silly.*

After the activity, CHE members were eager to act on what they learned. Discussion of risk and recommended limits led to this suggestion:

> *The [various states' regulations in]parts per trillion for cleanup of dioxin in soil has a wide range from 4 parts per trillion to 1000 parts per trillion. Guess where NC is? 1000 parts per trillion! We will push for legislative change in Raleigh to change the state level of dioxins to a reasonable level, more in line with other states.*

Ultimately, Chapter members decided to conduct another round of testing to confirm levels of dioxins in soil and water in relation to BMWNC. BREDL organizers and CHE members worked together to draft a map to help guide this work.

Through its campaign in succeeding months, CHE was successful in shutting down the local incinerator. Members believe that SfA helped them to understand level of risk and advocate more effectively. As noted above, the victory was bittersweet, however, as BMWNC was able to re-open in another location. In reflecting on the group's staying power and the support that BREDL provided, CHE's Chapter leader had this to say:

> *Not a single person who played it out to the end thought that they would make a difference in the long run…. They just felt that they couldn't sit back and continue to do nothing. I guess*

that's what I love about this struggle…the realization that it can be done, but not without a lot of support, technical and otherwise.

CHE is now re-grouping to gather support for any cleanup efforts that may be necessary to address soil and water contamination caused by BMWNC's operation in Mecklenburg County.

- ***PW and efforts to oppose the use of methyl iodide in California strawberry fields***

In their work with community members who are fighting the use of the dangerous pesticide methyl iodide (MI), PW facilitated numerous workshops and meetings with local activists over the course of two years. These workshops provided information about the risks that the application of MI on strawberry fields poses to residents in the counties of California's Central Valley. The main purpose of the meetings was to help residents understand these risks and launch a campaign to prevent the use of MI in the state. Prior to their involvement with SfA, PW organizers did not incorporate numeracy into their work with community group members. But they realized through their work with SfA that local activists needed to understand measurements and data in scientific research related to MI in order to communicate levels of risk to the wider public. So PW introduced SfA to these community group members, using *Messaging with Analogies* and *Messaging by Scaling Up and Down,* to facilitate greater understanding of the numbers. When interviewed in May 2012 about this experience, participants recalled that it was very helpful to have people puzzle out the math and science as a group and that this approach to strengthening numeracy could help their campaign. In the words of one activist,

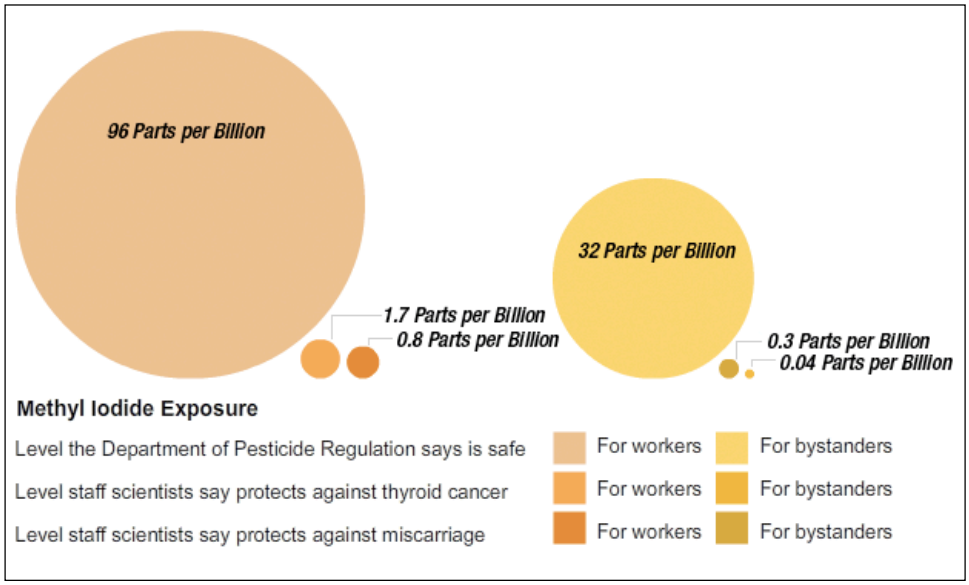
The lesson is that yes, it's good to simplify the numbers for the broad public. Similarly, it's powerful to simplify impacts to growers. When used together, both groups of stakeholders can more quickly recognize risk to their position.

Another confirmed,

It is vital to do this so that everyone has a basic understanding of the facts and can present those facts with confidence and documentation to the public. It is also a vital (process) in understanding the arguments used against our issues by those who fear financial reputation damage.

PW's application of SfA with this group also led activists to consider how numeracy-rich materials and approaches could reach a wider and more diverse audience. After the workshop, one community member observed,

I think it would be good to have more math/science-based forums on fumigants, pesticides, toxics, etc. (with) multilingual/cultural community dialogues.



With PW's support in the last year, this group of local activists has collectively produced a number of numeracy-rich fact sheets, a power point presentation, and written and oral testimony to help them win their campaign.

Moreover, they have submitted roughly twenty Letters to the Editor to various Central Valley, CA newspapers written by members of community groups during the Safe Strawberry (MI) Campaign. In one letter, a Salinas-based community member articulates the many reasons why methyl iodide as a fumigant is dangerous, including this point that utilizes an SfA-inspired analogy:

> *While fumigating fields is effective at battling nematodes, so is rotating strawberry crops with broccoli. Unlike methyl iodide, however, broccoli is not lethal at concentrations measurable in parts per million.*

Ultimately, he calls upon other Monterey County residents to call their county supervisors to approve a non-binding resolution recommending that the state ban methyl iodide.

- ***TAC's use of SfA with two community groups: Coalition for Clean Air and Winthrop Airport Air Hazards Committee (WAAHC)***

TAC's work with community groups has also shown that facilitated discussion about numbers and statistics linked to environmental problems can prompt lively discussion among community members and a desire to act on lessons learned. Prior to their involvement with SfA, TAC organizers did not incorporate numeracy into their organizing efforts, but throughout the four years of their involvement with the project, learned how to use SfA effectively at the community group level. When TAC introduced the SfA activity "Memorable Messages" to members of the Coalition for Clean Air,[7] the group's responses were enthusiastic. Some people liked the examples with fewer total numbers; others liked the effect of big numbers, saying "more per billion sounds more impressive!" One member said he wanted data that are more

[7] This group is also referenced in Section 5: *Evidence of SfA impact on EO Staff*, above.

local and general, like, "if the oil were an inch deep, what would it cover? Rhode Island? Or South Watuppa Pond?" In a focus group conducted by Arbor consultants after the meeting, Coalition members spoke highly of the SfA activity and said they planned to use SfA as a resource to help move their campaign forward.

Similarly, TAC's work with the Winthrop Airport Air Hazards Committee in Winthrop, Massachusetts led to useful discussion and a consideration of next steps. The group, which has been in existence for forty years, aims to reduce air pollution from nearby Logan International Airport. Members have won some important victories in the past, including a successful battle against a massive airport expansion proposal in the 1990s, but when TAC began working with them, their campaign had stagnated.

In an effort to help them better understand the risks of volatile organic compounds (VOCs), a TAC staffer decided to introduce the SfA activity, "Risks: Point of Contact." Beginning with Smart Math Moves, the TAC organizer encouraged the group to slow down and compare new information presented with what they already knew. One group member said he thought it would be easy, but when he became frustrated, another group member who understood the value of Smart Math Moves told him, "Bob, just slow down!" While doing the Risks exercise, community group members expressed surprise by many of the risk rankings. One group member had placed the highest risk activity – living in a contaminated building – as the lowest risk, which prompted extended discussion. This exercise was useful in helping the group consider the pros and cons of a conducting a health study.

Since this first introduction to SfA, the WAAHC campaign has been reinvigorated and is now pushing for a community benefits agreement with MASSPORT, the operator of the airport. Community members plan to make a set of demands soon, and according to the TAC organizer working with them, "we"ll certainly be using the numbers and statistics when we do".

- ***SfA and Community Group Leadership***

In three instances that Arbor documented, exposure to SfA led a community member to take more of leadership role in a group's campaign, with the goal of helping other members interpret campaign-related math and statistics and communicate this information more effectively to the public. One member of the BREDL Chapter Clean Air Now (CAN) described herself as "pug stupid when it comes to math" in an early survey administered by Arbor. This local activist has since stepped forward to chair the CAN Chapter. She attributes her added confidence to BREDL and to SfA. "Most important, you need to 'keep the numbers friendly and slow down'", she says.

A PW member from the Safe Strawberry (MI) Campaign used an SfA approach to translate big numbers into common everyday numbers, in order to explain the dangers of the pesticide

Methyl Iodide to the local public. She found that as a result, "*fellow citizens could comprehend the information, sign petitions and participate in the campaign*".

Finally, a community member who works with TAC played a key role in communicating findings about a superfund site in Billerica, Massachusetts called Iron Horse Park, incorporating numeracy-rich materials into media outreach on flyers, Facebook, and in public comments to the EPA. Later, TAC's Director worked with the local community group to get a New England Center for Investigative Journalism story printed throughout New England, featuring this activist member and the work he was doing to fight the superfund site.

- ***Impact of SfA Activities on Community Members: Survey Results***

During the final year of project implementation, Arbor disseminated a short survey to community members who participated in SfA activities. Survey questions focused on the effects of the activity on participants' confidence, learning and action. Activities implemented were those that EO partners considered to be most relevant to the community group's immediate concerns, including:[8]

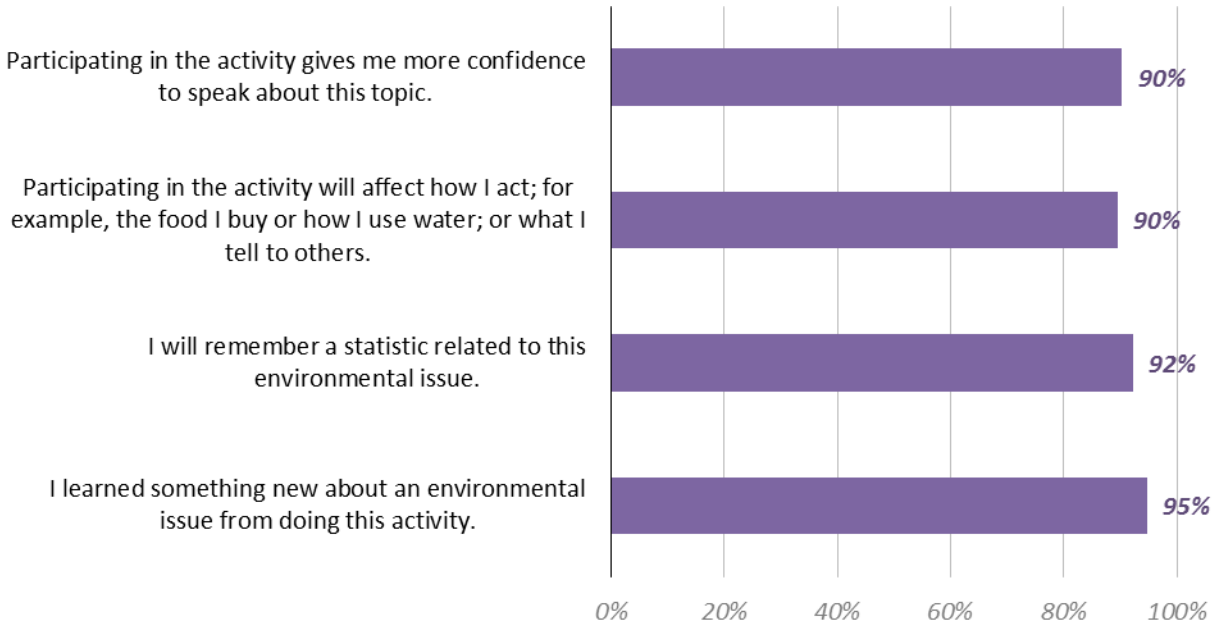
- Exposed!
- First Look at Technical Documents
- Measuring
- Memorable Messages
- Not Detected
- Percents at a Glance
- Risk: Point of Contact?
- Sampling Plans
- Toxic as…

Activities assessed through survey research were led by partner EOs, including COCEJ and the LA EJ Network, who joined the project in Year 4.

Results summarized in Figure 11 below provide strong evidence of the positive impact of SfA on community group members, across all measures. Ninety-five percent of participants report that the activity they participated in increased their learning about an environmental issue. Large shares of respondents reported that the activity influenced their behavior regarding foods purchased, how they use water, and what they communicate to others (90%), and gave them more confidence to speak about a topic (90%). In addition 92% of respondents said they would remember a statistic relevant to the activity, an important numeracy-related outcome.

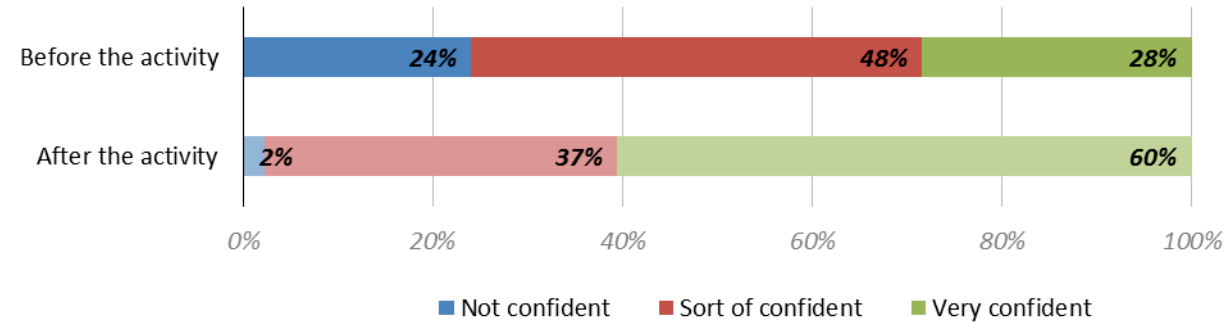
[8] A short description of the context in which each of these activities was implemented is included in Appendix C.

Figure 11.
Share of Community Group Participants Responding "True for Me" (N=187)



Results also show important increases in participants' self-reported confidence in understanding an environmental issue before and after the activity (see Figure 12 below). Since SfA activities focus specifically on math and statistics in the context of environmental organizing, this is strong evidence that numeracy-rich materials and approaches can be of practical help to community members in their advocacy work.

Figure 12.
Community Group Members' Level of Confidence in Understanding an Environmental Issue Before and After the Activity (N=183)



8. SfA activities have broad impact

As noted earlier, TERC staff encouraged EOs to find productive ways to introduce SfA materials and/or apply SfA approaches with wider audiences beyond their work with community groups. In parallel with research designed to gauge the response of community group members to SfA activities, Arbor also developed a survey for EOs to gauge the response of broader audiences to SfA activities, including at workshops, conferences and meetings. EOs selected SfA activities considered to be most relevant to their audience's interests, including:

- *A First Look at Challenging Claims*. This activity was incorporated into a workshop that TAC conducted at its annual conference in Boston.

- *SfA Soil Guide: Digging into the Dirt*. At a workshop led by LA EJ Network organizers, participants tested and reviewed SfA activities related to the units of the guide, reviewed the SfA video on soil, and completed one of the analogies activities.

- *SfA Water Guide: Read Before Your Drink*. With support from a TERC staffer, TAC organizers used this Guide in a workshop for environmental activists at the New England Environmental Justice conference.

As documented below in Figures 13 and 14, survey results for workshop participants broadly mirror results for community group members described in the previous section of this report. Since the audience in these workshops includes peers, it is not surprising that increases in the proportion of participants' who report that they are very confident in understanding an environmental issue after the activity (see Figure 14 below) are proportionately smaller than the gains we reported for community members.

Figure 13.
Share of Conference and Public Event Participants Responding "True for Me" (N=51)

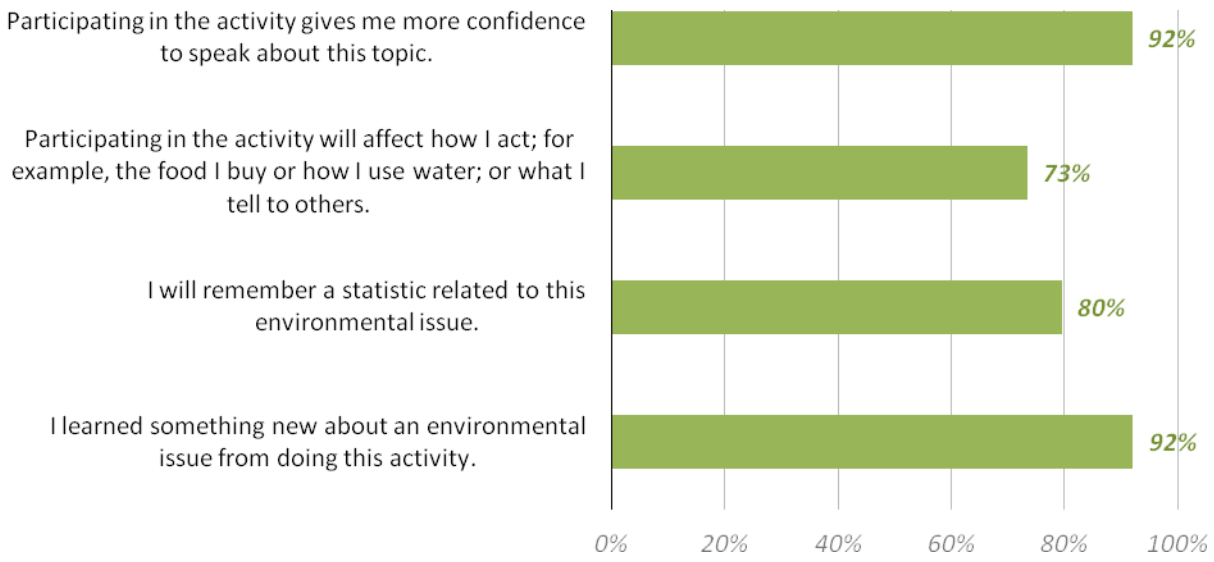
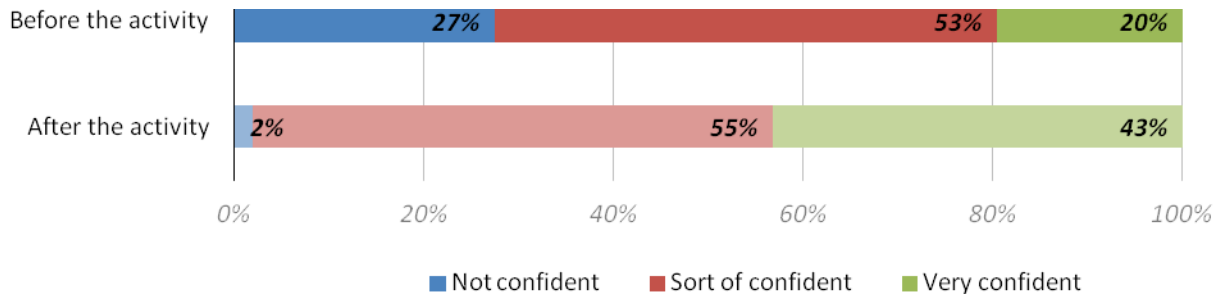


Figure 14.
Conference and Public Event Participants' Level of Confidence in Understanding an Environmental Issue Before and After the Activity (N=51)



9. SfA and *The Change Agent*

As noted in our Year 3 Report, all participating EOs were invited to submit a compelling story about the environmental issues facing their communities, to be published in *The Change Agent,*[9] a magazine that educates and mobilizes teachers and learners to apply advocacy skills in response to community challenges. Produced in collaboration with The New England Literacy Resource Center the March 2011 issue of *The Change Agent* includes easily accessible articles, written by organizers from each of the participating EOs, as well as TERC staffers and an SfA Advisory Committee member. For example, the issue includes an article by an LVEJO community member about fighting contaminants in the Little Village neighborhood of Chicago, and another, written by a BREDL organizer, which chronicles the fight against asphalt pollutants in North Carolina. Each of these articles weaves numeracy-rich materials developed through SfA into grass-roots accounts of community efforts to identify pollution sources and deal with them. Many of the stories model ways of communicating with numbers, grounded in SfA approaches, and include the stories of communities served by TAC and PW, in addition to BREDL and LVEJO.

This innovative partnership with *The Change Agent* enhanced the project in several ways:

- It provided EOs with a unique opportunity to showcase their efforts and so encouraged EO engagement with the project;
- Co-creation of materials for *The Change Agent* reinforced the collaborative nature of the relationship between EOs and TERC;
- Some EOs used the articles to facilitate learning about math and statistics in the context of their environmental organizing;
- The distribution of *The Change Agent* to 15,000 subscribers, including schools and community groups, introduced large numbers of adults around the country to important information about how to use data and measurement to better understand risks to their health and safety;
- Links to this issue of *The Change Agent* on SfA, TAC, BREDL, LVEJO and PW websites increased the audience for these numeracy-rich materials.

In the final year of the project, TERC has continued to promote the dissemination of *The Change Agent.* This has included distribution of the magazine to students in adult education classes from low-income communities and communities of color that are disproportionately exposed to environmental and other toxins. This year, this issue of *The Change Agent* was distributed to adult learners in New York City, Boston and Chicago. In New York and Boston, the magazine was introduced by adult education professionals in their regular classes. In Chicago, a former organizer from LVEJO took the initiative to collaborate with a local nonprofit

[9] *The Change Agent* is a biannual magazine for adult educators and learners published since 1994 by the New England Literacy Resource Center at World Education.

that offers English as a Second Language (ESL) classes. This organizer mobilized what she learned through SfA to lead an ESL class with *The Change Agent* as the focus. This is yet another example of SfA's extended reach and an example of how environmental organizers engaged by TERC have become increasingly imaginative in their implementation of SfA. According to this Chicago organizer,

> *I had seen Change Agent and it has some great resources, but I hadn't found a way to use it with (community) volunteers. There was always that lingering desire to do something with this magazine. I thought about it (and realized that) the level of English (in The Change Agent) was… not too advanced for ESL students. The Director of Literacy looked it, and she said medium and advanced classes could do it. It was an experiment – and we just did it! I was able to create … short activities (for a total of) 1 ½ hours with them. It really worked out well. Everyone wanted to participate.*

In order to document adult learners' responses to SfA content in *The Change Agent*, Arbor designed a short survey which was administered by adult educators to their students once they had reviewed *The Change Agent* content. In all adult education settings in which the magazine was introduced, students chose one or two articles to read and discuss. Popular topics included: risks associated with cigarette smoking, keeping children safe from lead and other toxins in the home, and risks associated with exposure to pesticides used in growing fruits and vegetables.

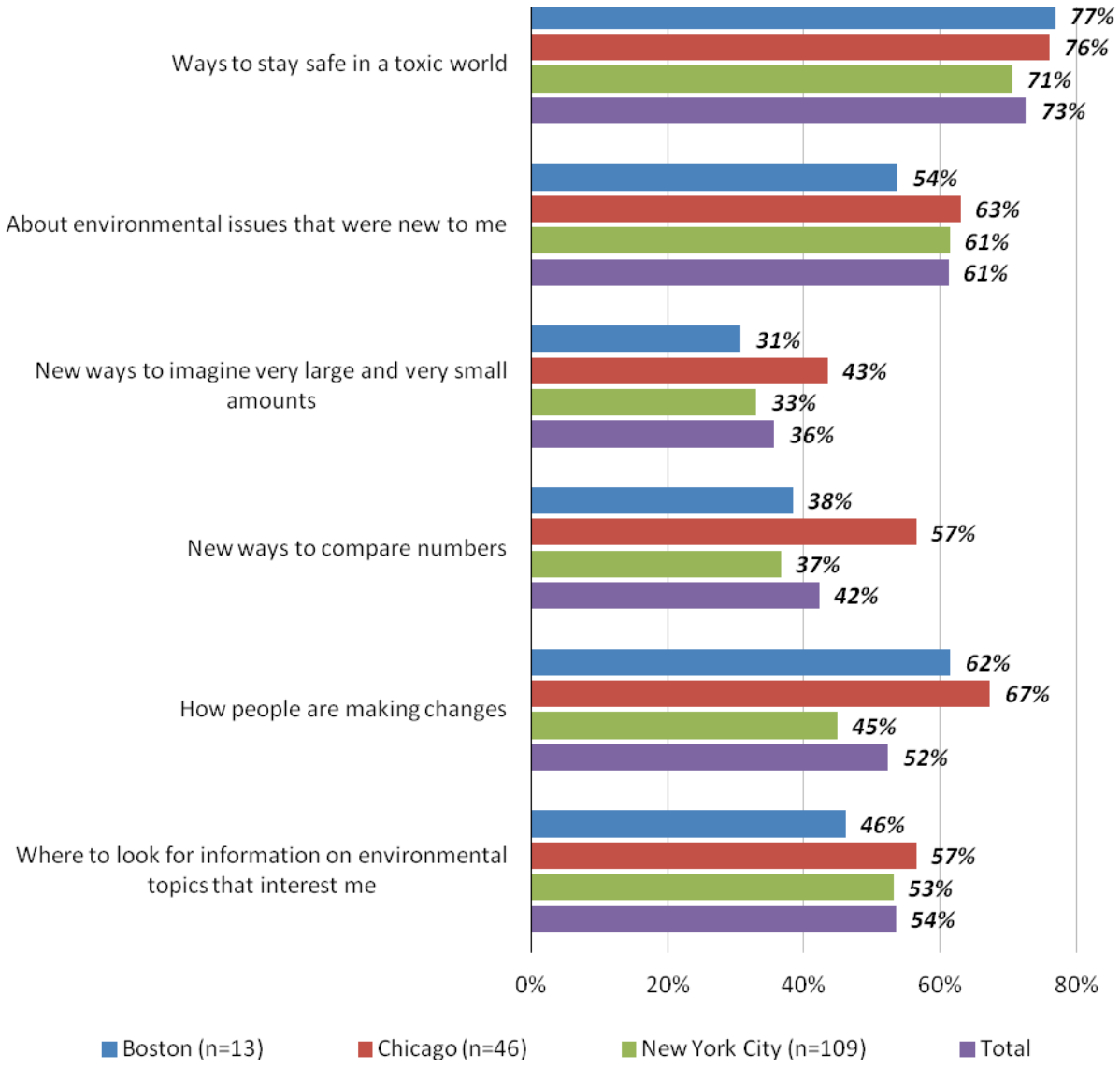
Survey results indicate that, for some students, information contained in the magazine was new and very compelling. In their written comments, several respondents indicated that they were surprised by the variety of toxins that could affect their family and their community. Sample comments include:

> *I didn't realize how nasty and harmful smoking is. I am going to try and stop smoking.*
>
> *Washing my hands with toxic pesticides! I was hurting myself and didn't know it.*
>
> *My youngest kids mostly tested positive for lead, one of them usually higher. So I'm going to make it my business to find a treatment for them before it gets worse.*

Survey results also show positive learning outcomes for most respondents related to environmental issues and ways these can be addressed (see below Figure 15). For example, over half of all respondents report that *The Change Agent* helped them learn about "ways to stay safe in a toxic world." In addition, more than a third of respondents reported specific numeracy-related learning outcomes ("new ways to imagine very large and very small numbers;" "new ways to compare numbers"). These results suggest that SfA can be relevant

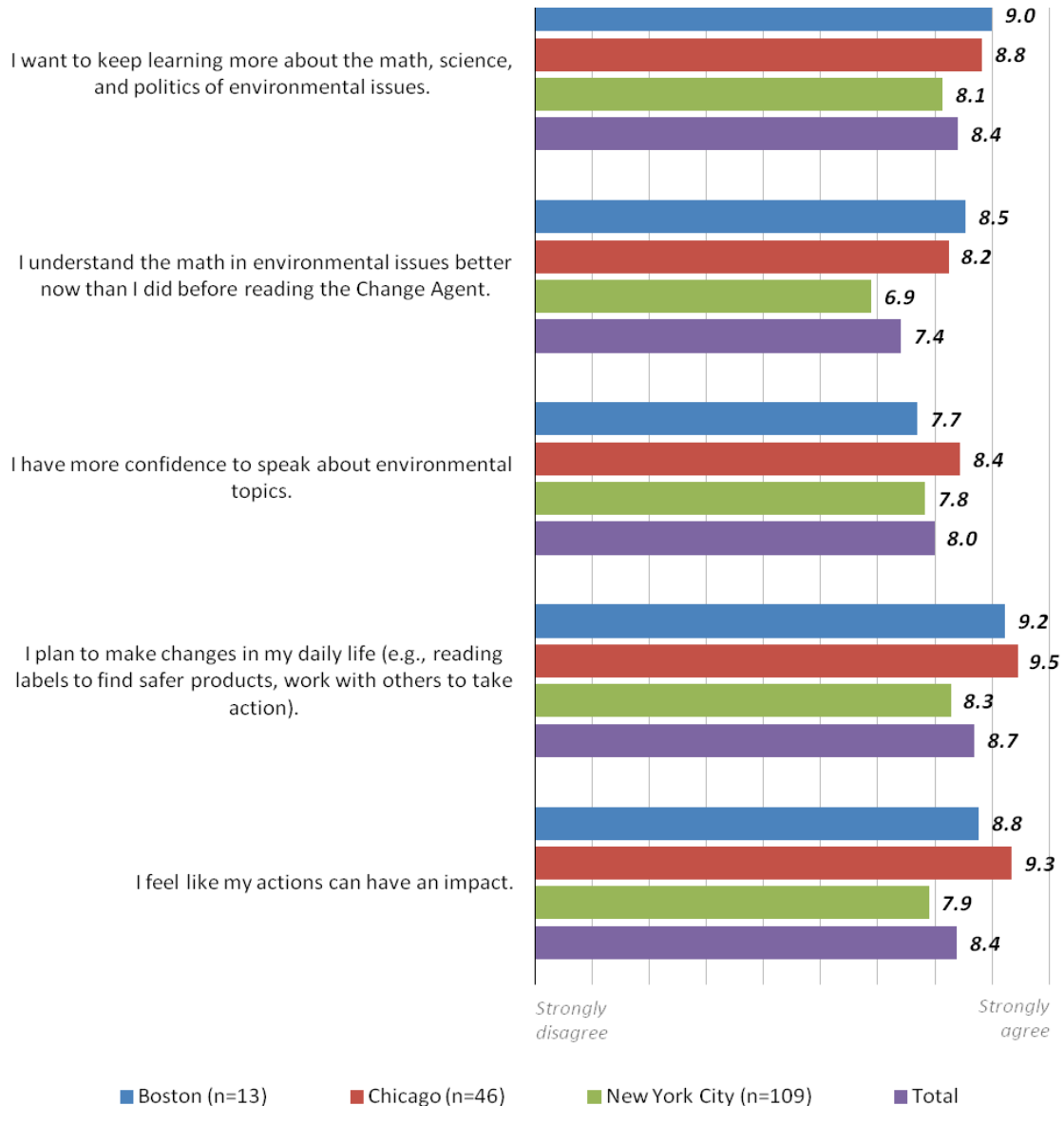
even for adults who are not currently involved in local community action. These results also indicate that, without special training or background, literacy educators were able to use SfA materials to promote numeracy related learning, but not quite as effectively as an organizer with training. This is reflected in the higher proportion of Chicago respondents who reported numeracy-related learning gains. In contrast to New York and Boston where literacy educators led discussions, discussions in Chicago were facilitated by a seasoned environmental organizer who had trained in SfA.

Figure 15.
By organization, share of respondents indicating that *The Change Agent* helped them learn…



Results described in Figure 16 below suggest that many adult learners felt inspired, empowered and/or spurred to action by what they read in *The Change Agent*. Respondents' mean ratings indicate that a majority of adults gained some understanding of the math in environmental issues even if, as noted above, they did not always develop new math-related skills. Most reported that they want to keep learning about the math and science as well as the politics of environmental issues.

Figure 16.
Respondents' Mean Ratings After Reading *The Change Agent*



Relatively high scores for Chicago respondents described in Figure 16 above again suggest that appropriate facilitation of SfA content can boost impact. Scores are high overall, however (mean rating for every measure in the graph above is in the "agree" to "strongly agree" range). As noted above, this suggests that SfA content embedded in a magazine designed for adult learners can help many adults understand numbers and statistics related to issues that are of interest to them.

10. SfA's direct and indirect reach is impressive

In order to gauge the broader impact of SfA, TERC asked EO partners to tally the numbers of people reached either directly or more broadly, through their work on SfA, between October 1, 2010, and May 31, 2012.

Direct reach

The definition provided to EOs by TERC for "direct reach" is as follows: "Adults or youth who were part of an activity, workshop, who read a guide, or participated in a training where SfA materials were used. Participants who learned something and expected to pass it on. Active participants in a campaign."

In our analysis of the reported data, we found that EOs collectively affected roughly 2,300 individuals directly, through community meetings, training sessions, workshops, and presentations. For example, BREDL reached 350 people through Chapter Leaders meetings, community group meetings, fracking presentations and community canvassing. LVEJO reached 529 people through a "skate jam", a workshop with Chicago teachers and students, workshops on water and soil, "toxic tours" around the neighborhood, and leadership training. TAC reached 925 people through annual conferences in Massachusetts and Vermont, work with community groups in Providence, Rhode Island, New Hampshire and Massachusetts, and the TAC Advisory Board meeting. Pesticide Watch reached 181 people through activist training workshops, an environmental conference, community group meetings, at a high school health fair, at a neighborhood soil testing and clean-up day, and through a presentation at a migrant center on pesticides in the home and schools. In addition, Operation Green Leaves reached 25 individuals directly through screenings of Eco-Alert.

In addition to these direct "exposures" to SfA through these original EO partners, other individuals who were exposed to SfA include: members of three Chicago-based nonprofits who participated in SfA training with Selene, former LVEJO staffer; adult education students in New York City, Boston and Chicago who reviewed and assessed *The Change Agent*; and individuals who participated in SfA workshops via two additional nonprofits, LA EJ and COCEJ. Sfa videos produced in collaboration with Operation Green Leaves had a powerful impact on a select

group of audience members we interviewed, who then pledged to promote the videos and share them more widely in their own communities.

Broader reach

EO partners were also asked to report "broader reach" which was defined as follows: "Folks who were an audience for something that was developed with SfA funds or with an SfA approach. For example, folks who saw a fact sheet, decision makers who heard a presentation, read a newsletter article, watched a news broadcast or cable TV broadcast of a hearing that included speakers using SfA Smart Moves or sound bites developed at a meeting where there was an SfA activity. Probably individuals, not engaged in a group process."

Beyond those who were reached directly, the numbers of people reached indirectly by EOs is impressive. Over 1,020,000 people have been exposed to SfA during the same time period. In some cases, the broader exposure resulted because the individuals who were trained directly then went on to share what they learned with a larger audience. For example, BREDL, whose structure is framed around supporting a network of 40 chapters, reached 40 leaders directly at a chapter leaders meeting, who in turn, returned to their communities and shared SfA materials with 400 individuals at the community level. TAC staffers trained 20 organizers directly at an environmental conference, but also distributed 250 Change Agents at the conference. PW trained 20 organizers who then distributed 200 fact sheets based on SfA materials. And in one community, a TAC organizer trained 10 community group members, and 1,000 people were reached in that community through a mailing that included SfA content.

The broader reach was achieved, in some cases, through local media that published editorials or stories which incorporated SfA-inspired messaging. For example, local newspapers where PW successfully published editorials inspired by SfA framing of environmental issues have a readership of at least 1,000 people. Moreover, Operation Green Leaves' Eco-Alert videos were aired on cable TV stations that have an audience of 1 Million viewers. Finally, in addition to distribution of Change Agent through EOs, the magazine has 15,000 subscribers who received the March, 2011 issue featuring SfA-inspired stories and materials.

	Numbers reached directly	**Broader reach**
BREDL	350	7,320
LVEJO	457	1,255
PW	181	7,400
TAC	975	3,089
OGL (Eco-Alert videos)	25	1 million (rough estimate)
Selene training (with 3 Chicago nonprofits)	59	NA
COCEJ	14	NA

	Numbers reached directly	Broader reach
LA EJ Network	36	NA
River Network	26	NA
Change Agent • With 3 adult ed orgs • Distributed by BREDL, PW and LV • Distributed to Change Agent subscribers	 161 NA NA	 NA 821 15,000

By broadening its focus with EOs to include use of SfA in conferences, events and in the media, TERC staff was able to maintain the engagement of EO staffers, who continued to utilize SfA resources, as well as strengthen their knowledge and capacity to utilize the range of SfA activities and approaches.

The extent to which this broadened approach, in which EOs used SfA materials and approaches in a variety of capacities, ultimately was a good match for how EOs operated, varied to some degree among the EO partners. Perhaps for BREDL, the approach was the most obvious fit, as the organization's structure easily aligned with producing materials for conferences, press releases, and so on. At the same time, while TAC organizers initially focused their efforts on trying to incorporate SfA into community group campaigns, they welcomed TERC's encouragement to broaden their approach to include other venues where they operated, and staff was able to utilize SfA materials and approaches in an impressive variety of venues. Similarly, PW and LVEJO adapted to the shift easily. Ultimately, this shift in approach resulted in getting SfA out to a far broader set of audiences than originally conceived.

11. SfA strengths and adaptability allow EOs to institutionalize approaches and materials

> *Before, I thought that (SfA) was separate (from what our organization does). Now I see how it is fundamentally connected… SfA has added to our tool-chest. It's allowed me to feel more confident about diving in to the scientific stuff. Wherever we go, we always bring The Change Agent and SfA materials, to help show what we can do with a group.*
>
> Asael, PW staff

One of the most important goals of SfA has been to ensure that the project will be sustained beyond the funding period, and ultimately incorporated into the ongoing practices and normative culture of its partnering organizations. Institutionalization of SfA involves a multi-tiered effort, first by the project itself, to create key elements of the project that are sustainable over time, and second, by the partnering organizations, to establish concrete methods to

integrate SfA materials and methods into the organization's infrastructure and its ongoing work. Institutionalization is one of the most challenging goals of any project, and the measure of success of any project is, in part, the extent to which it has developed its capacity to be sustained over time.

As described throughout this report, TERC has created a full-bodied set of materials that are easily accessible via the web, with navigation tools that help facilitate their use. Many of these materials reflect universal problems within environmental organizing, and therefore have a long shelf-life. In addition to its expansive set of SfA activities, TERC's web-based resources provide concrete directions on how to use SfA materials, including recommendations for sequencing activities to address specific needs. These materials are aimed at supporting the independent use of SfA by EOs, and provide a foundation upon which EOs have moved towards institutionalizing SfA. Without having these materials in place, EOs would not have advanced as they have in institutionalizing SfA.

Other measures taken by TERC that have contributed to the sustainability of SfA include:

- TERC-initiated all-partner calls were deliberately aimed to identify opportunities to fit SfA into EO's ongoing work with communities, and partners shared best practices;
- A significant number of materials are available in Spanish, making them accessible to the growing Latino population in the U.S. who are disproportionately affected by environmental problems within their communities;
- Between two and four years of training provided by TERC staff, coupled with intensive coaching and technical assistance, to partnering organizations has created a deep understanding and commitment to using SfA's materials and approaches among EO staff;
- TERC staff has been clear with partnering organizations about its timeline and the project end-date, concomitantly weaning their support, and encouraging EOs to work independently; and
- TERC initiated monthly calls with partner organizations to help troubleshoot SfA implementation.

As we have described in earlier sections of this report, there has been robust buy-in from EO leadership for application of SfA in the ongoing work of their organizations. Moreover, EO organizers have made striking gains in their confidence levels and skills in using SfA materials with community groups and in their work with peers.

As the project funding comes to a close, the level of institutionalization of SfA in EOs is impressive, as reflected in several key markers. Here are some outstanding examples of how partnering organizations have incorporated SfA into their "way of doing business":

Using SfA materials as part of the overall approach in working with community groups: Not only does SfA provide a robust set of materials; it provides a framework that EO partners have embraced. As one PW organizer says:

> *SfA has shaped my communication with community groups because it has given me a framework to focus on science and numbers.*

In fact, PW has incorporated a number of SfA materials into the workshops they provide for community groups. According to one of their organizers,

> *I think the thing I like most about the use of the SfA materials is that they are packaged workshops for community groups. Having these resources allows us to spend more time actually working through issues with community members rather than having to plan a specific training for individual groups.*

Ultimately, according to another PW organizer,

> *Incorporating the workshops from the SfA materials has been a very helpful process for Pesticide Watch. We have been able to work through soil sampling with garden groups and get our central coast methyl iodide groups to think about and message around exposure and safety (of this pesticide).*

In fact, this organizer wants to tackle more of the guide and is looking forward to more diverse work with other groups so that she can do this. It has been a real resource for her.

As evidence of institutionalizing SfA into their approach with community groups, TAC has expanded its consultant modules to include an SfA module on "Interpreting Test Results". When TAC staffers initially meet with community groups, they offer this module, along with seven others, as possible workshops they will provide. As the TAC director says,

> *We have such a formalized training program, a suite of training for community groups. (So) it was easy to institutionalize SfA materials. We formalize our in-house training for staff; we do it two times a year... The system is set up. It's easier for us to expand the tools in our toolbox. We're building capacity…*

By offering an SfA workshop as one of their training options to community groups, it not only sustains that particular SfA approach; it also sustains the link the organization has to using SfA materials as part of its overall approach.

Reflecting on the importance of SfA materials, one TAC organizer comments,

> *I do feel great though about the fact that if a (TAC) organizer is working with a community group that wants to know about health studies, we've got this great resource that she can just go to in the manual that has essentially everything she would need to know. And just because we do so much and each of our staff works on fifteen campaigns on a whole range of different toxics issues and we run so many different kinds of training, there is some element of, 'Here are the tools in your toolbox and we can't train you on everything at once, but it's there for when you need it'.*

BREDL offers SfA-inspired advice to all new Chapters as part of their orientation. According to a BREDL organizer, as a result of our experience with SfA,

> *We always start by counseling new Chapters to form a fact sheet right away and have a press advisory ready to go. We encourage them to think about what math facts to include and encourage them to create visuals.*

Training new staff

Despite its small staff of three, a PW staffer says he was trained in how to use SfA materials and approaches immediately after being hired. He recalls that "*initially it was a lot to take in*", referring to the knowledge uptake and style of facilitation, but he found that the SfA website helped him absorb the pedagogy and lessons of how to implement SfA with community groups.

TAC has now incorporated SfA into all of their new staff trainings, which involves initial exposure to SfA materials and training, and ongoing mentoring of new staff who are supported to practice the use of SfA in staff trainings and ultimately in other venues, including at conferences and with community groups. We have observed new TAC staff being trained by the "veterans" in the use of SfA, and through interviews and focus groups, we have also heard them describe their transformation from feeling resistant and overwhelmed with SfA materials to feeling confident and capable in using SfA materials in their work with community groups. It is the commitment of leadership within the organization, combined with the infrastructure of the organization, that supports this process of bringing new staff "into the fold" of SfA. One TAC staffer who has been mentored by a "vet" organizer in the organization, commented,

> *I've been thinking about SfA for about eight months, so I think in some ways, I kind of understand the framework SfA tries to build in your brain. (My mentor) and I were at a conference and (we saw) a big, beautiful graph of a slide and I said, 'it's an analogy', and (my mentor) said "SfA!.*

BREDL also introduces SfA to new staff members as a matter of course. All BREDL organizers are encouraged to keep a copy of the SfA Facilitator's Manual on their desks to use as a

reference. Organizers with greater familiarity with SfA mentor BREDL organizers with lesser experience. Staffers now are at various points in their journey with SfA. According to an organizer,

> *Some BREDL staff use SfA materials on a regular basis. Others are still in the planning stages, using SfA tools when given specific direction.*

The effect of EOs training peers

In addition to training their own staff, EOs also train other organizers in SfA materials and approaches. As we have discussed earlier in the report, BREDL has incorporated SfA into their training with their 40 Chapter leaders, utilizing their large network to spread SfA knowledge and skills more broadly. TAC organizers have presented SfA in their annual conferences in Massachusetts and Vermont, and have brought the SfA message to other environmental groups through events and meetings. As one TAC organizer said,

> *(The TAC organizer) ran a workshop for community leaders that essentially trained them to be trainers and used First Look with their groups. And to me that was kind of like peeling away to the next layer. And it sounds like it was a very successful workshop. And so even over the course of this year, in the fall I ran "First Look" as though people were members of my community group, and now we're training community leaders how to run it for their own groups. It's nice to see that we have been able to shift so much over the course of the year and go deeper.*

While these examples of EOs training their peers in SfA exemplify ways that SfA is being spread to a broader network, the act of training their peers solidifies SfA knowledge for EO partners, and strengthens their capacity to sustain SfA within their own organizations.

Incorporating SfA into EO websites

All of the original EO partners – BREDL, PW, TAC and Operation Green Leaves – either currently have, or are in the process of developing a link to SfA on their websites. Operation Green Leaves (OGL), an organization which focuses on community and media, includes a link on its website to SfA, with directions to viewers to "mouseover" the image to bring up specific pages of the SfA site. OGL's website also links to the three Eco-Alert videos they developed in collaboration with SfA. BREDL has included SfA in several places on its website and is in the planning stages of adding more links to make SfA tools even more accessible. BREDL also uses the League's online newsletter to promote materials developed through SfA. This has included a one-page overview of soil testing with advice on how to prepare for and conduct tests, interpret results and effectively communicate results to neighbors. PW now has an SfA link on their website, and they are planning to devote an entire section of their soon-to-be overhauled website to SfA. And in addition to including SfA materials and a link to the SfA website, TAC's website also includes the history of their partnership with TERC around SfA.

Challenges to Institutionalizing SfA

Despite these important indicators of SfA institutionalization, there are other factors that remain challenges to sustainability. For example,

- Generational distance – Given the normative turnover rate within the nonprofit sector, in some cases, the initial staff that are trained in SfA materials and approaches have left their organizations. When new staff join the organization, they are more distanced from the excitement of SfA implementation, and feel less connected to the experience of the "vets" who feel more intensive ownership of the project and engagement with its development and implementation; and
- Importance and challenging of networking – TERC made a significant effort to bring partners together via the two Advisory Committee meetings, as well as via all-partner phone calls. And in fact, two of the participating organizations (TAC and PW) have maintained the strongest association of all the groups, providing joint training for staff and sustaining a regular connection. Other organizations have been less inclined to sustain that connection with their fellow SfA partners. No doubt, EO partners face significant challenges in terms of the crises they are working to address, inadequate staffing, long working hours and so on. At the same time, we believe that, despite these challenges, there are significant benefits to establishing mechanisms for ongoing networking among the partners in order to sustain SfA beyond the life of its relationships with TERC.

V. Summary Observations and Recommendations

- ***Institutionalization of SfA establishes EOs as important hubs for further development and application of SfA***

SfA's success has depended crucially on the buy-in and sustained participation of environmental organizations. In this respect, the project was supremely successful. Excepting the unusual case of LVEJO, all EO partner organizations became committed collaborators led by Directors who acknowledged the central relevance of SfA to their work and mission. In the case of most EO partners, SfA materials and approaches have become institutionalized as a part of their menu of supports for concerned citizens. In addition, each of these organizations connects regularly with peers at conferences and workshops. This level of EO commitment to SfA and SfA institutionalization ensures that EO partners will continue to act as "hubs" for the dissemination of SfA approaches to the field, increasing the likelihood that SFA will be further developed and applied.

- ***SfA positively influenced EO staff's knowledge, skills and strategies***

EOs staffers were on the front line as students of SfA, co-creators of SfA materials and implementers of SfA in the field. Our research confirmed that some staffers who started with limited numeracy skills were initially uncomfortable with the math introduced through SfA while others were worried that community members would be resistant to numeracy-related materials and approaches. With consistent support from TERC, however, most staffers became proficient with SfA's numeracy-rich resources and had largely positive experiences implementing SfA with community groups. Our research confirmed that some EO staffers came to see themselves as numeracy or math literacy educators, incorporating SfA teaching strategies and "smart move" principals more consistently over time. As described above, our qualitative results and results of survey research provide ample evidence of staffers' gains in SfA-related knowledge and skills, and their application of SfA in community settings. Once again, this capacity located in active, connected and respected organizations can impact the field through peer exchange and generate outcomes for a wider selection of community members.

- ***Project adaptation promoted successful community-level implementation and broader impact***

When it became clear that community groups were not open to long-form SfA workshops in the midst of urgent campaigns, EOs shifted their approach and implemented SfA in a more selective fashion. Staffers also found ways to maximize utilization of SfA materials and training beyond their work with community groups, including at events, conferences and meetings. Both adjustments were promoted by TERC and led to improved results: on one hand, staffers' targeted use of SfA led to more productive engagements with community members; on the other, staffers' workshops and presentations exposed SfA to greater numbers of people, including other organizers. This exposure resulted, in turn, in a number of positive outcomes for participants, including an awareness of statistical data related to an environmental issue.

- ***Leveraging SfA advisors and wider networks moved SfA beyond partners EOs and community groups***

Over the four-year period, TERC turned to advisors and to members of other networks to broaden the reach of SfA beyond the EOs and community groups that EOs engaged. Having advisors and others who believed in the power of SfA and its potential impact contributed importantly to the successful implementation of the project.

- ***EOs give high marks to SfA materials, and find creative ways to use them both in community-based environmental campaigns and with peers***

Over the four-year period, TERC developed a full array of powerful materials, grounded in the locally-based environmental issues of the environmental organizations. Overall, community

leaders in partners' networks gave high marks to SfA materials both in terms of their relevance and their utility.

- ***EO learning was reinforced by the link between website, training, coaching and technical assistance***

TERC created and linked key project components to strengthen SfA application. While the SfA website provides a comprehensive set of SfA tools (e.g., manual, guides, videos), training provided by TERC staff, as well as subsequent coaching and technical assistance, were essential to build and cement EO learning about and utilization of SfA materials and approaches.

- ***SfA project reach is impressive.***

As summarized earlier in this report: more than 2,000 people were reached directly including adults or youth who were part of an SfA activity or workshop, or who read an SfA guide or participated in a training where SfA materials were used. In addition, over 1,020,000 people were exposed to SfA during the period of project implementation, including people who received a fact sheet, decision makers who listened to a presentation and individuals who read a newsletter article or watched a news broadcast or cable TV broadcast.

- **SfA and *The Change Agent***

The special SfA issue of *The Change Agent* provided EOs with a unique opportunity to showcase their efforts and encouraged EO engagement with the project. Our research also confirmed that situating environmental data in the context of stories can help parents, lifelong learners, and low-skilled workers increase their critical awareness of environmental issues and their numeracy skills.

- ***SfA had an impact on community members learning and behavior***

Altogether, over 40 community groups in twelve states benefitted from SfA materials and activities introduced in workshops and meetings facilitated by partner EOs. As documented in this report, large shares of community members who were exposed to SfA reported that SfA activities had a positive influence on their confidence, learning and/or willingness to act on environmental issues as well as their awareness of the relevance of statistics in their advocacy work.

V. Recommendations

1. SfA website is powerful but has potential to become more interactive, facilitating deeper connections between and among EOs, community groups and the broader public

The SfA website is robust, with multiple and varied resources (e.g., manual, testing guides, Facilitators Manual, videos) and the excellent array of resources provides critical information to organizers. At the same time, it could be strengthened by becoming more interactive and by promoting network connections among its users. Given the expansive scope of SfA, TERC would require more resources to continue building the website, but we believe that users and potential users are primed to take SfA to this new level. We suggest several areas for the expansion of web-based communication that includes the website as well as other possible platforms.

- ***Facilitate greater links between/among those in EO community using social media and on-line platforms***

TERC staff initiated a conference call with EOs, encouraging them to share and critique each other's SfA-inspired fact sheets, developed to advance community-based campaigns. Organizers found this sharing and mutual critiquing of materials extremely useful, fostering productive dialogue about how to incorporate numbers and statistics into public materials. This favorable response by EOs suggests that it would be useful for TERC to create more such opportunities for EOs to share ideas and materials, whether through the vehicle of the SfA website, through the use of social media, or the use of an independent on-line platform. For example, a Facebook "wall" could be created by TERC for EOs to post pictures and captions that could help their colleagues better understand their process and goals for proposed communication/messaging. An online platform for EOs to "meet" (for example NING) could generate and facilitate dialogue among organizers regarding incorporating SfA-inspired materials into their ongoing work. Linking EOs in either of these ways could have the important effect of connecting SfA "hubs" – organizations that play a central role in communicating and informing others – and improving their capacity to communicate emergent learnings to each other, to community groups and to their peers. These online "Communities of Practice" could be a platform for organizers to meet, share information, problem-solve, develop stronger connections, and explore opportunities to partner on future projects. We recommend that TERC consider seeding this notion with EOs in follow up conference calls or, if possible, at an in-person gathering designed for this purpose.

- ***Facilitate story-telling about how SfA influenced/affected environmental organizing efforts***

Another new direction would be to develop the use of Change Agent-type story-telling on the SfA website, in which EOs and CGs would be encouraged to contribute their stories/updates,

including how they incorporated SfA into the campaigns – or even to share where they encountered obstacles in doing so and how they overcame those obstacles. Partner EOs are already highlighting or linking to SfA through their own websites but might consider posting stories of success or "how to's" more visibly.

- ***Engage the larger public***

The SfA website could be "marketed" more broadly to the extended networks of current partners, as well as via other environmental groups, coalitions or networks, and even to media outlets. Interactive mechanisms could engage the larger public by making numbers and statistics more accessible and by providing templates for individuals and groups to utilize SfA resources to impact environmental issues in their locales.

- ***Dedicate a section of the website for educators***

While the project did not originally target educators of adult learners, TERC discovered that this cohort was an excellent "fit" for SfA-infused material. As we described earlier in the report, The Change Agent provided an excellent resource for this group, and offered a robust source of material for educators to teach literacy skills in the context of real-life stories. We recommend that a section of the website be dedicated to educators of adult learners, to support their use of The Change Agent and other SfA-infused materials as a tool to teach reading and math literacy skills.

2. ***Develop stronger network among EOs***

TERC staffers were extremely thoughtful about how to encourage EOs to become increasingly self-reliant over the life of the project, so that EOs could ultimately sustain SfA-related practices once the project was completed. Efforts were also made to build network connections between participating EOs, including two all-partner meetings with the advisory committee, and a number of all-partner phone meetings. Advisory committee meetings were highly valued by EOs, as they gave organizers a direct line to experts in how to incorporate numeracy into environmental campaigns. We believe that at least one more all-partner meeting with advisory committee members would promote a more sustained connection among advocates especially if, in the future, this connection will be made principally online. At this gathering, EO partners could share plans to move forward in their use of SfA, consider on-line and off-line options for continued peer-learning, and also develop plans to engage advisory committee members in future efforts.

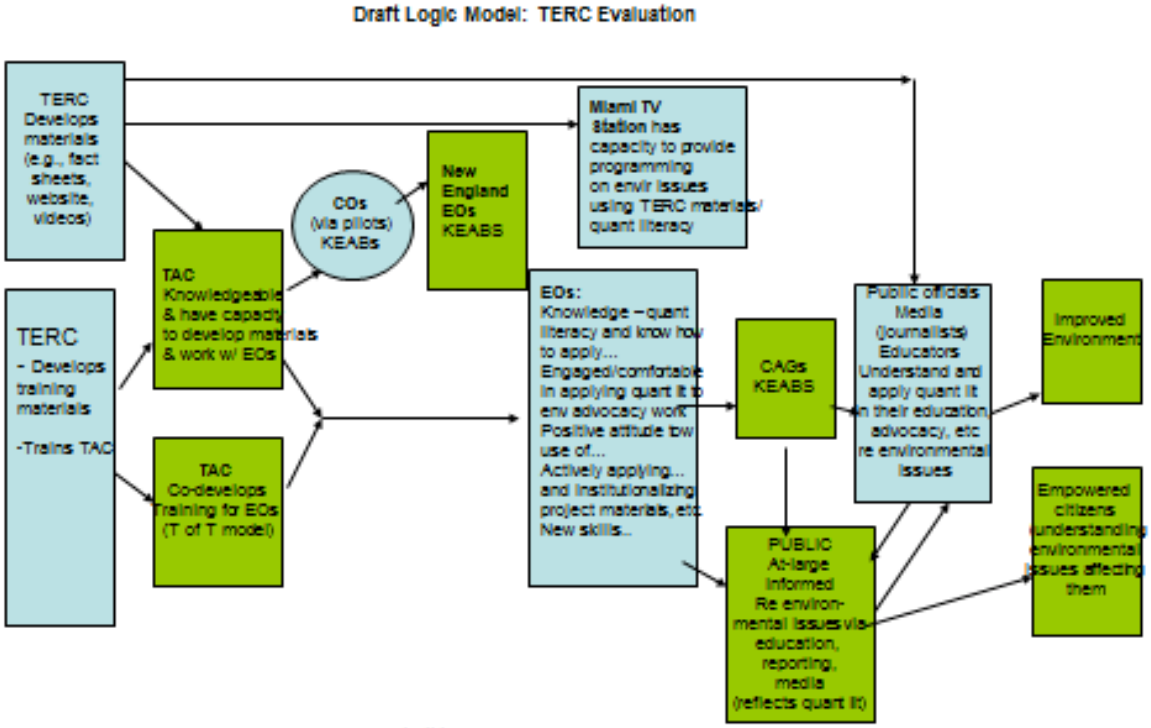
3. Bring SfA into other informal settings and to different disciplines

We recommend that SfA be expanded to take its adult numeracy approach into other kinds of settings, to apply lessons learned and to figure out new ways to adapt its methods. Research should be conducted throughout this process, as SfA moves into other areas – possibly from discipline to discipline – in order to best use lessons learned for replication purposes. We believe that this would involve a shorter development timeline because of lessons learned about process, but new applications will undoubtedly surface different challenges. In the end, we believe in the power of the materials and the methods, and strongly advocate that SfA be continued and adapted in other venues.

4. Widely disseminate lessons learned from SfA

We recommend that TERC explore a number of venues to share lessons learned from SfA, which would include the traditional routes of conference presentations, journal articles, list serves, in addition to promoting the SfA website widely. But in addition, given the nature of SfA, we suggest that TERC develop a dissemination strategy with its partners and with well-networked individuals on its Advisory Committee. We believe that SfA can make a difference on a wider scale, and suggest that TERC consider further dissemination in its next steps.

APPENDIX A



KEAB s = knowledge, engagement, attitude, behavior and skills

Questions:
•Include process eval of TERC-TAC partnership?
•Include eval of public-at-large impact?

Appendix B: 2012 Protocols

1) *Statistics for Action Year 2* Survey for Directors of Environmental Organizations

Welcome to the Survey for SfA Environmental Organizations!

***Statistics for Action* (SfA) is a project that strengthens environmental organizers' understanding and use of numbers and statistics in local environmental issues so that they may be incorporated into their environmental advocacy efforts. The project is developing materials for environmental organizers to use in their work with community group members. Survey results will be used to improve the effectiveness of SfA materials.**

Thank you for your participation!

***Statistics for Action Year 2* Survey for**
Directors of Environmental Organizations

Name: _____ **Date:** _____
Your Title: _____

Organization: □ TAC □ PW □ BREDL □ LVEJO

INSTRUCTIONS
Please answer the following questions completely. All of your responses will be held in strictest confidence. Please note that there are no right or wrong answers.

A. MATH AND SCIENCE CONTENT IN YOUR ORGANIZING WORK

1. **How often do you or others in your office receive calls from community groups about environmental questions that need math or science knowledge (e.g., questions about interpreting reports, understanding toxicity levels)?**
   - ☐ Daily/Almost daily
   - ☐ Weekly
   - ☐ About once a month
   - ☐ Rarely or not at all

2. **Please tell us about the use of math and science content (e.g., use of numbers, data or measurements) in your work with community groups. (Please select the best answer for each item.)**

	My organization…	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
a)	Has the materials we need to make the math and science in reports and regulations understandable to community organizations.	□	□	□	□	□	□
b)	Provides effective training to staff on the math and science components of environmental organizing (e.g., data, statistics, measurement units)	□	□	□	□	□	□
c)	Includes math in most of its trainings and orientations.	□	□	□	□	□	□
d)	In hiring, considers the math or science background of applicants (e.g., knowledge, comfort, ability to teach others)	□	□	□	□	□	□
e)	Has staff who are comfortable facilitating conversations about statistics in community group settings.	□	□	□	□	□	□
f)	Works creatively to make math and science content meaningful/understandable to others	□	□	□	□	□	□

3. **In the last 12 months, have you modified your approach to the math or science content (e.g., use of numbers, data or measurements) in your organizing work with community groups?**

   ☐ Yes

   ☐ No

   ☐ I don't know

   <u>If yes</u>, what prompted you to modify your approach to the math or science content (e.g., use of numbers, data or measurements) in your organizing work with community groups during the last 12 months? (Please check all that apply.)

   ☐ Specific request(s) from constituents (e.g., community members need/want statistics)

   ☐ Specific request(s) from elected officials

   ☐ Specific request(s) from the media

   ☐ Your engagement with *Statistics for Action*

   ☐ Your organization recognized the need to modify your approach to respond to timelines and/or to particular environmental issues that arose in your region.

   ☐ Other. Please describe: _____

4. If you checked Statistics for Action, in question 3 above, what specifically about your engagement with SfA helped you modify your approach?

5. In year 2, which SfA features and/or components have helped you modify your approach? (please check all that apply)

a) □ First Look at Test Results
□ Definitions of numeracy
□ Approaches to facilitating math learning, e.g., Smart Math Moves
□ Background material and stations on units
□ Background material and stations on limits and levels
□ Background material and stations on sampling
□ Background material and stations on units risk
□ Background material and stations on communicating with big and small numbers
□ Contributing to guides on water and soil testing and hazardous waste clean up or health studies

6. What (if anything) do you find challenging about increasing the math and science understanding of community group members you serve?

B. PLEASE TELL US MORE ABOUT YOU

1. Gender

☐ Male
☐ Female
☐ Transgender
☐ Other

2. Race/Ethnicity (Please check all that apply.)

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White
- ☐ Hispanic or Latino(a)
- ☐ Other. Please specify _____

3. Age

- ☐ Less than 20 years of age
- ☐ 20 to 30 years of age
- ☐ 31 to 40 years of age
- ☐ 41 to 50 years of age
- ☐ 51 to 60 years of age
- ☐ 61 to 70 years of age
- ☐ 71 to 80 years of age
- ☐ More than 80 years of age

4. **Highest level of education**
   - ☐ Some high school
   - ☐ High school diploma or GED
   - ☐ Some college (no degree)
   - ☐ Associate's degree, AA in _____
   - ☐ Bachelor's degree, BA or BS in _____
   - ☐ Graduate degree in _____

5. **How long have you worked in <u>this</u> organization?** _____

6. **What position do you hold?** _____

7. **How long have you worked in the field of environmental organizing (not just in this organization)?** _____

8. **Would you like to learn more ways to explain math and science ideas that are relevant to environmental organizing?**
   - ☐ Yes
   - ☐ No

   <u>If yes</u>, what areas would you like to see (e.g., specific areas of math)?

   _____

   _____

9. **Do you have any particular background or experience that you think will help you with implementing SfA (e.g., coursework in math or science, math- or science-oriented professional development)?**
   - Yes
   - ☐ No

   <u>If yes</u>, please describe (including when it occurred, length, content, etc.).

   ___

   <u>If yes</u>, how has it affected your math and science knowledge/comfort level?

C. STATISTICS FOR ACTION *ACTIVITIES*

1. **Overall, how would you rate the materials SfA has generated?**
   - ☐ Poor
   - ☐ Fair
   - ☐ Good
   - ☐ Excellent

2. **Overall, what would you say are the strengths of SfA-generated content in your activities (e.g., math and/or science content)?**

3. **Overall, what would you say are the weaknesses of SfA-generated content in your activities (e.g., math and /or science content)?**

4. a) **Do you have any suggestions or recommendations for how SfA-related *content of the materials* could be improved? Please describe.**

   b) **Do you have any suggestions or recommendations for how SfA-related *activities* could be improved? Please describe.**

5. **If there is anything else you would like us to know, please comment here:**

Thank you for completing the SfA Directors Survey.

2) *Statistics for Action* Baseline Survey for Environmental Organization Staff

Welcome to the Survey for SfA Environmental Organizations!

***Statistics for Action* (SfA) is a project that brings out the numbers and statistics in local environmental issues. The project is developing materials and approaches for you to use in your organizing work with community group members. Survey results will be used to improve the effectiveness of SfA approaches and materials and make them more useful to others confronting environmental hazards.**

Thank you for your participation!

***Statistics for Action* Baseline Survey**
Environmental Organization Staff

Name: _____ **Date:** _____
Your Title: _____

Organization: □ TAC □ PW □ BREDL □ LVEJO

INSTRUCTIONS
Please answer the following questions completely. All of your responses will be held in strictest confidence. Please note that there are no right or wrong answers.

A. MATH AND SCIENCE CONTENT IN YOUR ORGANIZING WORK

1. Please tell us how you feel about the math and science content in your work with community groups. (Please select the best answer for each item.)

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
a)	I like math.	□	□	□	□	□	□
b)	I am comfortable using software to create graphs and charts.	□	□	□	□	□	□
c)	I know of many ways to explain measurement units.	□	□	□	□	□	□
d)	I know of many ways to explain statistics.	□	□	□	□	□	□
e)	I think it's important to take time/opportunities to make technical reports understandable to community group members.	□	□	□	□	□	□

(cont. from previous page)

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
f)	I enjoy taking time/opportunities to make technical reports understandable to community group members.	□	□	□	□	□	□
g)	I have the skills I need to teach math to community group members.	□	□	□	□	□	□

2. Please tell us about your knowledge relating to the following topics. (Please select the best answer for each item.)

In general, I know how to…		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
a)	Anticipate costs and fundraising needed to carry forward a campaign.	□	□	□	□	□	□
b)	Understand a city or state budget process as it pertains to local environmental issues.	□	□	□	□	□	□
c)	Interpret toxicity levels measurements and quantities in water, soil and air quality reports.	□	□	□	□	□	□
d)	Interpret measurements and quantities in regulations.	□	□	□	□	□	□
e)	Understand data collection and sample size.	□	□	□	□	□	□
f)	Verify that results are reasonable.	□	□	□	□	□	□
g)	Gauge an appropriate level of precision.	□	□	□	□	□	□
h)	Use fractions, decimals, percents and/or ratios.	□	□	□	□	□	□
i)	Use powerful numbers in press releases and outreach.	□	□	□	□	□	□
j)	Interpret graphs, table, and charts.	□	□	□	□	□	□
k)	Create spreadsheets, graphs, tables, and charts.	□	□	□	□	□	□
l)	Understand land measurements and zoning regulations.	□	□	□	□	□	□
m)	Use technology (e.g., web-based research, computer-based models, google mapping).	□	□	□	□	□	□

3. Please tell us about the skills you bring to building others' understanding of science and math related to community issues. (Please select the best answer for each item.)

I have the skills I need <u>to help community members</u>…		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
a)	Anticipate costs and fundraising needed to carry forward a campaign.	□	□	□	□	□	□
b)	Understand a city or state budget process as it pertains to local environmental issues.	□	□	□	□	□	□
c)	Interpret toxicity levels measurements and quantities in water, soil and air quality reports.	□	□	□	□	□	□
d)	Interpret measurements and quantities in regulations.	□	□	□	□	□	□
e)	Understand data collection and sample size.	□	□	□	□	□	□
f)	Verify that results are reasonable.	□	□	□	□	□	□
g)	Gauge an appropriate level of precision.	□	□	□	□	□	□
h)	Use fractions, decimals, percents and/or ratios.	□	□	□	□	□	□
i)	Use powerful numbers in press releases and outreach.	□	□	□	□	□	□
j)	Interpret graphs, table, and charts.	□	□	□	□	□	□
k)	Create spreadsheets, graphs, tables, and charts.	□	□	□	□	□	□
l)	Understand land measurements and zoning regulations.	□	□	□	□	□	□
m)	Use technology (e.g., web-based research, computer-based models, google mapping).	□	□	□	□	□	□

4. **Imagine you are leading a meeting in which you are helping community members understand the math involved in interpreting the toxicity levels in water, soil or air quality reports. Which would you be most inclined to do? (Please check all that apply.)**

   ☐ Explain the math involved clearly and logically

   ☐ Elicit an estimate

   ☐ Ask participants to figure it out themselves first and compare solution strategies with one another

   ☐ Present a problem situation and ask pairs to work together on multiple solutions

   ☐ Show how to plug numbers into a formula on a calculator or spreadsheet

(cont. from previous page)

   ☐ Provide a visual or supply manipulatives (such as cubes weighing a gram each or measuring tools)

   ☐ Ask people to draw the problem, then compare different people's ideas

   ☐ Present an example and engage others in seeking patterns

   ☐ Show people an example and offer repeated practice

   ☐ Make an analogy or use a metaphor

☐ Other. Please describe: _____

5. Examining the strategies in question 4, please circle any steps that you would not include.

6. Please read the following scenario and answer the corresponding questions.

A community group receives an air quality report with the following entry:	
Carcinogen	µg/m³
Benzene	0.12

Someone in the group asks, "What does 0.12 mean?"

a) What would you do next?

_____

_____

_____

b) List some possible ways you could help someone understand this quantity.

_____

_____

_____

_____

c) Does your organization have supporting materials to help you address this kind of question?

☐ Yes

☐ No

☐ I don't know

7. **A recent survey revealed that 4,000 children in a town of 18,000 children had diagnosed or undiagnosed asthma. List some ways you could express this finding. Include at least one visual (in the space provided on next page). Which do you think is the most powerful and why?**

(space for visual)

8. **Do you find anything challenging about leading discussions with math or science content in your work with community groups?**

   ☐ Yes

   ☐ No

   ☐ Not applicable

   <u>If yes</u>, what do you find most challenging about leading math or science-based discussions with community members?

9. Please tell us about how often you have incorporated math and science content in the following ways with community group members <u>during the last 12 months</u>. (Please select the best answer for each item.)

	When you met with community organizations, how often, on average, did you teach math or science concepts by…	Rarely or not at all	Sometimes	Often	Always	Not applicable
a)	Explaining the math or science clearly and logically.	□	□	□	□	□
b)	Eliciting estimates or ballpark answers.	□	□	□	□	□
c)	Asking participants to figure something out themselves first and comparing solution strategies with one another.	□	□	□	□	□
d)	Showing how to plug numbers into a formula on a calculator or spreadsheet.	□	□	□	□	□
e)	Providing a visual or supplying manipulatives (such as cubes weighing a gram each or measuring tools)	□	□	□	□	□
f)	Asking for a picture, then comparing different people's ideas.	□	□	□	□	□
g)	Presenting an example and engaging others in seeking pattern.	□	□	□	□	□
h)	Showing people an example and offering repeated practice.	□	□	□	□	□
i)	Presenting a problem situation and asking pairs to work together on multiple solutions.	□	□	□	□	□
j)	Getting people up out of their seats to act out the problem.	□	□	□	□	□
k)	Making an analogy or using a metaphor.	□	□	□	□	□
l)	Adapting your delivery or communication of math or science content to suit specific situations or needs.	□	□	□	□	□

10. In the last 12 months, did you modify your approach to the math or science content in your organizing work with community groups?

☐ Yes

☐ No

☐ I don't know

<u>If yes</u>, what prompted you to modify your approach to the math or science content in your organizing work? (Please check all that apply.)

☐ Specific request(s) from constituents (e.g., community members need/want statistics)

☐ Specific request(s) from elected officials

☐ Specific request(s) from the media

☐ Your engagement with *Statistics for Action*

(cont. from previous page)

☐ You recognized the need to modify your approach to respond to timelines and/or to address particular environmental issues that arose in your region.

☐ Other. Please describe: _____

<u>If yes</u>, how did you modify your approach to the math or science content in your organizing work?

11. **Please tell us about your experience with the members of community groups you serve. (Please select the best answer for each item. If the members of community groups you serve have widely varying knowledge and attitudes, please check the column: "Cannot Generalize.")**

Community members…		**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Cannot Generalize**	**Don't Know**
a)	Generally like math.	□	□	□	□	□	□	□
b)	Are good at math.	□	□	□	□	□	□	□
c)	Will avoid math if given a choice.	□	□	□	□	□	□	□
d)	Struggle with the math that has surfaced in their cause.	□	□	□	□	□	□	□
e)	Generally like science.	□	□	□	□	□	□	□
f)	Are good at science.	□	□	□	□	□	□	□
g)	Will avoid science if given a choice.	□	□	□	□	□	□	□
h)	Struggle with the science that has surfaced in their cause.	□	□	□	□	□	□	□

If you answered "Cannot Generalize" to any of the items above, please provide details.

12. In your experience, what strengths do community members bring to their use of technical science and math concepts?

13. In your opinion, what do community members' need to enable them to use technical science and math concepts more effectively?

14. At present, do you feel you have the skills and resources to support community members' effective use of math and science?

		Yes	No	I don't know
a)	Skills	□	□	□
b)	Resources	□	□	□

15. If you answered "no" to Question 14, what kind of help would be useful to strengthen your ability to support community members' effective use of math and science?

_____

_____

_____

_____

_____

_____

_____

_____

_____

PLEASE TELL US MORE ABOUT YOU

1. Gender

- ☐ Male
- ☐ Female
- ☐ Transgender
- ☐ Other

2. Race/Ethnicity (Please check all that apply.)

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White
- ☐ Hispanic or Latino(a)
- ☐ Other. Please specify _____

3. Age

- ☐ Less than 20 years of age
- ☐ 20 to 30 years of age
- ☐ 31 to 40 years of age
- ☐ 41 to 50 years of age
- ☐ 51 to 60 years of age
- ☐ 61 to 70 years of age
- ☐ 71 to 80 years of age
- ☐ More than 80 years of age

4. Highest level of education

- ☐ Some high school
- ☐ High school diploma or GED
- ☐ Some college (no degree)
- ☐ Associate's degree, AA in _____
- ☐ Bachelor's degree, BA or BS in _____
- ☐ Graduate degree in _____

5. **How long have you worked in <u>this</u> organization?** _____

6. **What position do you hold?** _____

7. **How long have you worked in the field of environmental organizing (not in this organization)?** _____

8. **Would you like to learn more ways to explain math and science ideas that are relevant to environmental organizing?**
   - ☐ Yes
   - ☐ No

   <u>If yes</u>, what areas would you like to see (e.g., specific areas of math)?

_____

_____

_____

_____

_____

_____

9. **Do you have any particular background or experience that you think will help you with implementing SfA (e.g., coursework in math or science, math- or science-oriented professional development)?**

   ☐ Yes

   ☐ No

   <u>If yes</u>, please describe (including when it occurred, length, content, etc.).

   _____

   _____

   <u>If yes</u>, how has it affected your math and science knowledge/comfort level?

   _____

   _____

Thank you for completing the SfA Environmental Organization Survey.

The following questions will be used in follow-up surveys, after SfA has been implemented.

B. STATISTICS FOR ACTION *ACTIVITIES*

1. **Overall, how would you rate the materials SfA has generated?**
   - ☐ Poor
   - ☐ Fair
   - ☐ Good
   - ☐ Excellent

2. **Overall, what would you say are the strengths of SfA-generated content in your activities?**

   _____

   _____

3. **Overall, what would you say are the weaknesses of SfA-generated content in your activities?**

   _____

   _____

4. a) **Do you have any suggestions or recommendations for how SfA-related *content of the materials* could be improved? Please describe.**

      _____

      _____

   b) **Do you have any suggestions or recommendations for how SfA-related *activities* could be improved? Please describe.**

      _____

      _____

5. **If there is anything else you would like us to know, please comment here:**

   _____

   _____

Thank you for completing the SfA Environmental Organization Survey.

3) *Statistics for Action* Baseline Survey for Community Members

Welcome to the Survey for SfA Local Community Groups

Statistics for Action has resources to help adults understand and use numbers in their work on local environmental issues. Survey results and feedback will be used to improve SfA materials.

Please answer all the questions. Your responses will be held in confidence. Note that there are no right or wrong answers.

Thank you.

Statistics for Action Baseline Survey
Community Members

What is your name? (First name, and first letter of your last name only)**:** _____

Date: _____

Your Community Group: _____

INSTRUCTIONS

Please answer the following questions completely. All of your responses will be held in strictest confidence. Only the evaluators will see your responses. Please note that there are no right or wrong answers.

---

10. How long have you worked on environmental issues overall (including the time with this current group)?

_____

11. How long have you been working on environmental issues with this current group?

_____

12. Please check all that are true for you:

- ☐ I like math.
- ☐ I will avoid math if I'm given a choice.
- ☐ I like science.
- ☐ I will avoid science if I'm given a choice.

13. Check one. In my group's work…

- ☐ **I use science or math**
- ☐ **I don't use science or math**

If you checked "I <u>don't</u> use science or math," please move to Question #7!

Otherwise, continue below…

Please check all that apply:

☐ I figure out the meaning of numbers to understand an issue. For example, I look at/ or I work out things like the chance of getting sick, the cost of a clean-up, the amount of toxins nearby.

☐ I use math, data or measurements when I explain things (the group's issue) to others.

☐ I don't focus on the scientific ideas when I talk about the issue with others

☐ I am able to explain some of the science to others when I talk about the issue.

14. Tell us how you feel... (Please select the best answer for each item.)

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Don't Know
a)	I feel confident using science and statistics in our group's environmental work.	☐	☐	☐	☐	☐	☐
b)	The math that is part of our group's work is hard for me.	☐	☐	☐	☐	☐	☐
c)	The science that is part of our group's work is hard for me.	☐	☐	☐	☐	☐	☐
d)	I think taking time to understand math and/or science will help the group's work.	☐	☐	☐	☐	☐	☐

15. In your group, is it important for YOU or SOMEONE or EVERYONE to understand the following? (Please check the best answer for each item in one of the four columns below.)

	Is it important for (you, someone, everyone) to understand…	**It's important for ME to understand…**	**It's important for SOMEONE in the group to understand…**	**It's important for EVERYONE in the group to understand…**	**It's NOT IMPORTANT for anyone to understand…**
a)	How to figure out the cost and impact of contamination for families in my community.	☐	☐	☐	☐
b)	What has polluted the water, air or soil.	☐	☐	☐	☐
c)	How much contamination is around us.	☐	☐	☐	☐
d)	How to interpret data in reports like lab tests.	☐	☐	☐	☐
e)	How to compare units like tons per day and parts per million.	☐	☐	☐	☐
f)	When a ballpark number is okay and when an exact number is needed.	☐	☐	☐	☐
g)	How my group can collect and analyze our own data.	☐	☐	☐	☐
h)	How to find out if test results are reasonable.	☐	☐	☐	☐

16. Are the skills listed below important to you? (Please select the best answer for each statement.)

	I think it's important for <u>ME</u> to be able to…	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**	**Don't Know**
a)	Make spreadsheets, graphs, tables, and charts.	☐	☐	☐	☐	☐	☐
b)	Use technology (e.g., web-based research, computer-based models, Google mapping).	☐	☐	☐	☐	☐	☐
c)	Use numbers to make a case.	☐	☐	☐	☐	☐	☐
d)	Use science concepts to make a case.	☐	☐	☐	☐	☐	☐
e)	Other. Please describe: _____						

_____

17. What background experience with math—numbers, data or measurements—do you bring to your group's environmental work (e.g., could be from your everyday life, your workplace experience, and/or formal training)?

Please describe here:

☐ None comes to mind

18. **If you have had a particular experience – positive and/or negative – using math—numbers, data or measurements—in your environmental work, please share what that experience is below.**

Please describe here:

☐None comes to mind

Finally, please check the appropriate boxes below. This will help the project as it develops and adapts its website and other materials for other community groups like yours.

1. Preferred language for reading and writing

- ☐ English
- ☐ Other. Please specify: _____

2. Age

- ☐ Less than 20 years of age
- ☐ 20 to 30 years of age
- ☐ 31 to 40 years of age
- ☐ 41 to 50 years of age
- ☐ 51 to 60 years of age
- ☐ 61 to 70 years of age
- ☐ 71 to 80 years of age
- ☐ More than 80 years of age

3. Highest level of education

- ☐ Elementary school

☐ Some high school

☐ High school diploma or GED

☐ Some college (no degree)

☐ Associate's degree, AA in _____

☐ Bachelor's degree, BA or BS _____

☐ Graduate degree in _____

4. Gender

☐ Male

☐ Female

☐ Transgender

☐ Other

5. Race/Ethnicity (Please check all that apply.)

☐ American Indian or Alaska Native

☐ Asian

☐ Black or African American

☐ Native Hawaiian or Other Pacific Islander

☐ White

☐ Hispanic or Latino(a)

☐ Other. Please specify _____

Thank you for completing the SfA Baseline Survey!

4) EO Staff Focus Group Protocol

EO Staff Focus Group Protocol

1. **Review all ways in which SfA has been used in your work**

In talking about these, focus on:

- Leadership development of staff in using SfA approach/materials
- Lessons learned based on this experience
- KEABS of staff…

2. **Extent to which SfA has been integrated into ongoing work of organization – give examples**

Probe:

- With COs
- In orientation of new EO staff
- At events, conferences, etc.
- Other

3. **Reflections on the use/relevance of SfA materials/training for COs**

Probe:

- Strengths in using SfA for campaigns; lessons learned (about goals for developing members' numeracy skills, use of math/numbers in work, etc.)
- Challenges in using SfA for campaigns; lessons learned (e.g., timing of use of SfA in life of campaign, relevance of SfA for different types of campaigns)

4. **How has working on SfA affected the role of math/science in your work?**

5. **What, if anything, has changed for you?**

Probe:

- Before I …
- Now I …

- How does this relate to KEABS - what have they learned as an organization about ways to incorporate SfA into their work?

6. **SfA on EO website – progress made in including SfA on website – making it accessible/user friendly**
7. **Are there other ways in which your organization made the materials more accessible?**

8. **Sustainability**

Probe:

- Level of engagement of Staff?
- Skill-development of staff
- Use of SfA in Training
- Development of materials (e.g., training guides, fact sheets, etc.)
- Use of SfA approaches/activities in ongoing EO work. Describe
- Are their certain aspects of SfA that have been most useful? In what ways are they sustaining this work?

9. **Challenges to integration/implementation?**

Probe:

- To what degree overcome challenges? Describe.

10. **How would you describe your collaboration with TERC?**

Probe:

- How would you characterize the collaboration?
- How has it evolved over the past four years?

11. **Role of Advisory Group – any sustained contact? If so, what was it? What effect did it have on your organization? On your SfA-related work? Etc.**

5) 2012 Community Groups Background and Focus Group Protocol

Community Groups Background and Focus Group Protocol 2012

1. How is the Campaign going now?

Probe:

- Strengths
- Challenges

2. What stage are you at in determining the ways in which SfA can help you with training?
3. What have you done so far with SfA?

Probe:

- received some training from (e.g., Sylvia, Ethan, Martha)

4. If used SfA materials: what materials have you used?

5. If used SfA materials, what did you think of them?

Probe:

- In what ways are they useful?
- In what ways were they not useful?
- Do you think they can (or did) advance your campaign? If so, in what ways?

6. How important is it to know/understand math/science in your work on the Campaign?

7. How would you describe your personal comfort level with math/science?

8. Is your group figuring out what your math and science needs might be with respect to your group's goals for the year?

9. When you have a math problem to solve in your group, do you rely on a few people to figure it out, or do you problem-solve as a group?

10. If you mainly rely on a few people, what do you think the advantages are of having more people in the group with the confidence and skills needed to address math-related questions? (This may help to reinforce the value of SfA and Arbor will learn about different group members' basis for buy-in)

11. Do you have a sense of how SfA could play a role in your future campaign work?

12. Do each of you have personal goals in terms of your own math/science understanding and skills that you'd like to acquire, and possibly offer to this group?

13. How could SfA best support your personal goals around using math and science? And, your group's goals?

14. Are you clear about what math and science needs your group has that SfA could help you with? (Please describe.)

15. Do you have a sense of how SfA could play a role in your future campaign work?

16. How is communication going with SfA (TERC and TAC), generally?

17. Do you need any more information about SfA to know how they can help you with the needs of the group?

6) Eco- Alert Focus Group Protocol

FOCUS GROUP: ECO-ALERT

After Video 1

1. Your initial gut reactions to video #1

Probe:

- Did you learn anything new? Please describe.
- Did the video leave you with any questions? What are they?
- Did you hear anything that made you change your mind/think about things in a new way?
- What sense are you left with? Ready for action, depressed, something else?
- If you had to look at a set of water quality test results, how confident would you be that you could understand them? (provide range: not at all confident, somewhat confident, very confident - then discuss)

Then explain: SfA typically offers people some ways to interact with the concepts and data of environmental testing

- So check out the stations set up.
- Get food.
- Then we'll watch the second video while we eat.
- As you watch the second video; keep in mind how the activities could be used along with it: before, after, during--did they support your understanding? If so, in what way/s?

2. Your initial gut reactions to video #2

Probe:

- Did you learn anything new? Please describe.
- Did the video leave you with any questions? What are they?
- Did you hear anything that made you change your mind/think about things in a new way?
- What sense are you left with? Ready for action, depressed, something else?
- If you had to look at a set of sediment test results), how confident would you be that you could understand them? (provide range: not at all confident, somewhat confident, very confident - then discuss).

3. Other audiences for both videos

Probe:

- Who needs to see this/get this kind of information? Who do you wish had been here watching this?
- Describe (children, adults, regulators, neighbors, other) Why? (as in, why choose that person)

4. How would you use the activities?

Probe:

- Before, after, and/or during the video?

- Did the activities support your understanding? If yes, in what way(s)?

5. Any advice for SfA moving forward?

Probe:

- Audiences?
- Suggestions for circulating videos?
- You or your group interested?

7) Activity Evaluation Form

Statistics for Action Activity

Please name or briefly describe the Statistics for Action activity you participated in:

_____

_____

Thinking about this activity, please tell us...

Are these statements TRUE for you, or do you DISAGREE? Please check!

	TRUE!!!	DISAGREE!	Don't Remember
1. I learned something new about an environmental issue from doing this activity.	□	□	□
2. I remember a statistic related to the environment issue.	□	□	□
3. Participating in the activity has affected or will affect how I act; for example, the food I buy or how I use water; or what I tell to others.		□	n/a
4. Participating in the activity gives me more confidence to speak about this topic.	□	□	n/a

5. Before you did this activity, how confident were you in understanding this environmental issue?

NOT CONFIDENT ____ SORT OF CONFIDENT____ VERY CONFIDENT ___ DON'T REMEMBER ___

6. After doing this activity, how confident are you in understanding this environmental issue?

NOT CONFIDENT ____ SORT OF CONFIDENT____ VERY CONFIDENT ___ DON'T REMEMBER ___

7. Do you feel committed to the environmental issue the SAME as, or MORE than before you did the activity?

THE SAME _____ MORE_____

8. What was the most interesting thing about doing this activity? How will it be useful to you?

_____

9. How could this activity be better? Anything else we should know?

_____

8) *The Change Agent* Evaluation Form

The Change Agent- Staying Safe in a Toxic World

This survey about the Spring 2011 Edition of *The Change Agent* is part of research for Statistics for Action - http://sfa.terc.edu . Statistics for Action helps organizers and community members use math and science in their work on environmental issues. The project is based at TERC - http://terc.edu. It is funded by the National Science Foundation. You must be 18 years old or older to take this survey.

Statistics for Action helped create the Spring 2011 Edition of *The Change* Agent: Staying Safe in a Toxic World. This survey asks you how the magazine changed the way you think about environmental science and math. Your feedback will help us to know what was most effective in The Change Agent. It will help us develop future learning materials. We will also include the results of this survey in reports to our funders.

Your participation in this survey is voluntary. No personal information about you is collected in the survey. If you are one of the first 100 people who fill out this survey, you can choose to enter a drawing to receive a $10 gift card as a thank-you from us. If you do, your name and contact information will be kept separately from your survey responses. Your participation in this survey indicates that you have read and agree to the above.

1. This issue of *The Change Agent* helped me learn...

(Check all that are true for you.)

- ways to stay safe in a toxic world
- about environmental issues that were new to me
- new ways to imagine very large and very small amounts
- new ways to compare numbers
- how people are making changes
- where to look for information on environmental topics that interest me

After reading the current issue of *The Change Agent*...

2. I want to keep learning more about the math, science, and politics of environmental issues.

1 2 3 4 5 6 7 8 9 0

Strongly Disagree Strongly Agree

3. I understand the math in environmental issues better now than I did before

reading *The Change Agent*.

	1	2	3	4	5	6	7	8	9	0	
Strongly Disagree											Strongly Agree

4. I feel like my actions can have an impact.

	1	2	3	4	5	6	7	8	9	0	
Strongly Disagree											Strongly Agree

5. What changes have you made (or do you plan to make) after reading *The Change Agent*?

For example: Read labels to find safer products, work with others to take action

6. What article or ideas made the strongest impression on you? Why?

Thank you for your feedback!

If you have any questions or concerns about the survey or the project, please contact Martha Merson at 617-873-9600 or Martha_Merson@terc.edu. You may also contact Mia Ong (617-873-9678; mia_ong@terc.edu), who is part of TERC's committee that oversees the human participants in research, which oversees the Statistics for Action project.

Please finish the survey by clicking "Submit" below. After you do, you can choose whether or not to be entered into a drawing to receive a $10 gift card for participating.

9) Numbers Reached Documentation Form

Statistics for Action
Numbers Reached

TERC needs to report a count of folks touched by SfA. Help us document from Oct, 2010-April 30, 2012. We listed numbers we have from past correspondence with you. If there's something we've missed, please add it. The information you provide helps us capture our impact.

Think broadly about our work together, including but not limited to specific SfA activities. Has our work infused your presentations generally, your outreach materials? If the answer is yes, then we want to know how widely they have been circulated.

- Reached Directly/ an engaged audience—Adults or youth who were part of an activity, workshop, who read a guide, or participated in a training where SfA materials were used. Participants who learned something and expected to pass it on. Active participants in a campaign.
- Broader Reach/the public—Folks who were an audience for something that was developed with SfA funds or with an SfA approach. For example, folks who saw a fact sheet, decision makers who heard a presentation, read a newsletter article, watched a news broadcast or cable TV broadcast of a hearing that included speakers using SfA Smart Moves or sound bites developed at a meeting where there was an SfA activity. Probably individuals, not engaged in a group process
- Following up—Evaluators are still open to learning about participants' perceptions of the impact on themselves and others. Make note of ideas for people we might be able to contact. In upcoming calls we can strategize on how--survey, interview, convene focus group.

Name _____ **Organization** _____

Event or outreach	**Date** (month & year)	**Number of people reached directly** (rounding is okay)	**Broader reach** (okay to estimate)	**Ideas for follow Group Leader, or participants? How to reach?**
Open Garden Day	*June 2011*	*100*	*350*	*call volunteer who helped*

10) SfA in Public Formats Documentation Form

Using SfA in Public Formats

What kinds of "products" have you developed, using SfA materials or approaches, to impact public opinion?

Product	**Description (e.g., info you're communicating via product & #s of product created)**	**Intended audiences**	**Venue**	**Effect/impact, if known, including Reactions/ comments from "intended audiences"**	**Extent to which "institutionalized" (will continue to use product and/or approach)**
Posters					
PPT presentations					
Fact Sheets					
Yard Signs					
Advertisements					
Written testimony (e.g., submitted to authorities)					
Oral testimony (e.g., submitted to authorities)					
Comments provided to journalists					
Technical reports or position papers					

Appendix C: Thumbnail Description of SfA Activities Surveyed

A. COCEJ Workshop

This workshop led by Tennie White of the Coalition of Communities for Environmental Justice (COCEJ) introduced the SfA activities 'Percents at a Glance" at a meeting of 14 residents concerned about the condition of the Hattiesburg South Lagoon in Hattiesburg, MS. The workshop was designed to help community members understand the cost to customers of different treatment technologies proposed by City of Hattiesburg for the Lagoon.

B. OGL screening of Eco-Alert videos

Nadine Patrice of Operation Green Leaves in Miami screened two Eco-Alert videos developed in concert with SfA to a Parent Teacher Association. In these videos, Patrice hosts a panel discussion about water and soil contamination with guests, Martha Merson (SfA) and other experts. Five people completed the activity evaluation forms.

C. TAC staff workshop with Winthrop Air Hazards Committee

In one of their evening meetings, TAC staff used the SfA activity, Point of Contact, with the community group, Winthrop Airport Air Hazards Committee, to help them better understand the risks of volatile organic compounds and exposure pathways. Participants were primarily white males, ages 55-80, and included a former airline pilot. There were six respondents to the activity evaluation form.

D. Selene Gonzalez workshop with CUT

Selene Gonzalez, former LVEJO staffer, conducted a several-hour workshop for members of the Center for Urban Transformation, a nonprofit organization that focuses on urban agriculture. Gonzalez used SfA activities "Point of Contact" and "Memorable Messages". There were twenty-four participants, primarily people of color, who completed this evaluation form.

E. TAC workshop with Neighbor to Neighbor

TAC organizer used their training module, "Interpreting Test Results", with a primarily Puerto Rican, Spanish-speaking group at a meeting of the nonprofit organization, Neighbor to Neighbor in Holyoke, Massachusetts. TAC developed this training module based on SfA materials, as one of the consultations they offer to community groups. In this training, the organizer incorporated a page of annual emissions data from the Mt. Tom coal-fired power plant, a primary focus of the group, into the activity. Six participants completed the evaluation form.

F. TAC workshop at annual conference

TAC organizer presented a workshop on Challenging Claims at the TAC annual conference, held at Northeastern University in Boston. The goal of the workshop was to teach attendees – environmental activists – how to identify dubious claims and how to challenge them. Organizer incorporated SfA activity, A First Look at Challenging Claims, into workshop presentation. Fifteen participants completed the evaluation form.

G. TAC conference in Vermont

TAC organizer conducted a workshop for sixteen participants, in collaboration with Vermont Natural Resources Council, and used Interpreting the Numbers.

H. Pesticide Watch Workshop with Oak Park Urban Agricultural Group

PW staff worked with Oak Park Urban Agriculture Community Group, which wanted to start an urban garden. Fourteen community members reviewed the SfA website and soil testing guide, and did a mapping exercise.

I. TAC-PW joint staff training

In this joint staff training, five participants worked with First Look at Technical Documents and the Water Guide.

J. Robina water workshop with LA EJ Network

The LA EJ Network has partnered with SfA, and in this workshop, one of its membership orgs, California Safe Schools, led a workshop using SfA's water guide. Twenty participants completed the form.

K. TAC water workshop at TAC EJ Summit

A TAC organizer, supported by a TERC staffer, led a workshop for environmental activists at the New England Environmental Justice conference, using SfA's Water Guide. Nine participants completed the evaluation form.

L. SfA workshop with River Network for COCEJ

With support from Steve Dickenson of the River Network and a TERC staff member, organizers with the Coalition of Communities for Environmental Justice (COCEJ) introduced an SfA activity focused on "Measuring" at a meeting of 26 residents of Hattiesburg, MS. Residents are concerned about odors and run-off caused by conditions in the Hattiesburg South Lagoon, where permitted amounts for total suspended solids have been violated. The meeting was designed to help community members assess test results for the Lagoon and create a plan of action.

M. TAC workshop with Somerset community group

TAC organizer led a meeting with eight members of the Somerset community group, which is focused on impact of local power plant. She used First Look at Technical Documents and Memorable Messages, to help community group members better understand the data and how to communicate it.

N. TAC EJ Summit with ACE

TAC used Memorable Messages for nine participants in this workshop, conducted collaboratively with Alternatives for Community and Environment.

O. LA EJ network on soil quality

The LA EJ Network, in partnership with SfA, conducted a 3-hour workshop on soil quality at a Network meeting. Prior to the meeting, facilitators distributed SfA's Guide to Soil Quality: Digging into the Dirt, and at the meeting, the group tested and reviewed SfA activities related to the units of the guide, reviewed the SfA video on soil, and completed one of the analogies activities. Forty-one participants completed the evaluation form.

P. Selene workshop with PCR

Selene Gonzalez, former LVEJO staffer, conducted a day-long workshop with nonprofit organization, People for Community Recovery, using Memorable Messages and Points of Contact with the group, drawing on local asthma data. Twenty-eight participants completed the evaluation form.