

*What are the criteria  
for a successful  
interactive Web site for  
Informal Science  
Education?*

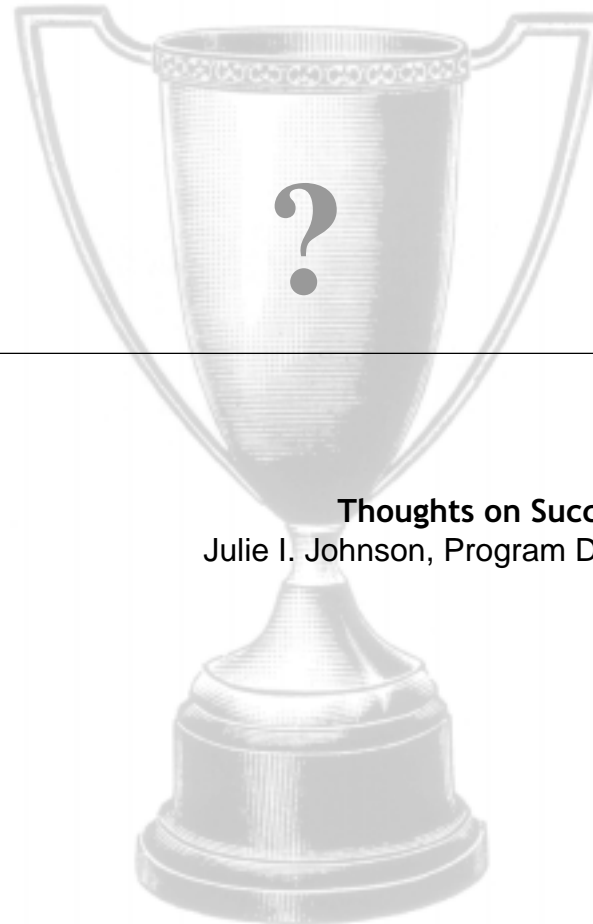
*What would success  
look like from the Web  
site visitor's  
perspective?*

*How do we assess  
whether or not we  
have been successful?*

*In our definition of  
success, are we  
limiting our goals to  
certain audiences? Are  
we ignoring other  
audiences?*

**WEB DESIGNS FOR  
INTERACTIVE  
LEARNING  
CONFERENCE**

June 15-18, 2005  
Ithaca, New York



# what is success?

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A Synthesis of Group Presentations

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Julie I. Johnson, Program Director, National Science Foundation



# Criteria for Successful Web Sites

## The Attempt at Definition: Murky Waters

### About This Synthesis

Conference participants, working in small groups, were asked to identify criteria for successful Web sites based on ideas gleaned from the conference and on their own past experience. Their collective ideas have been synthesized and grouped into categories.

While there were many commonalities in the ideas expressed during the group reports, this synthesis does not represent any form of consensus. It is an initial brainstorming step in the process of attempting to articulate the factors that contribute to a successful interactive Web site for Informal Science Education.

The hope is that this dialogue will continue on the WDIL Web site, with conference participants and members of the larger community contributing ideas, opinions, counter-arguments, and examples to help both veterans and newcomers to the field get a better handle on what we mean by success.

What are the criteria for a successful Web site? There are a number of reasons why this is a bad question. First of all, success is obviously a moving target because there are so many factors involved, and both the context and goals of various sites may differ widely. All sites, in the end, turn out to be fairly different from each other.

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*In any attempt to look at very broad principles for Web sites there will be many caveats due to the fact that there are many different types of Web sites. You need to identify which criteria or principles apply to your organization, your project, your audience, and your particular Web site, and come up with your own list of site-dependent criteria.*

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We are also in a transition period. It may seem like we are always in a transition period, but that transitory feeling seems somehow heightened right now. The pressures of a lot of fashionable new things, including blogs, wikis, and games, tend to make the waters murky in terms of figuring out what to do with those things.

And finally, even if you have a clear target audience, you have quite a bit of variability within that audience because you have to be able to work with

newcomers as well as with those who have been using the Web and/or your site for a while.

## First Step: Clearly Defined Goals

### The Zen Approach: Contemplate These Questions First

What is a successful Web site? Those involved in developing a successful Web site spend a lot of time thinking about what the criteria for their success is before anyone builds anything. Asking and answering the following five questions before, during, and after a site is created is fundamental to success:

- What are we doing?
- Why are we doing it?
- For whom are we doing it?
  - Did we do it?
  - How do we know?



The need to ask these questions may seem self-evident, but there are an awful lot of Web sites out there that were clearly built without anybody really thinking these things through and having some answers before they started. If you have worked on a site like that, you know that it is anything but pleasurable.

What it amounts to is the need to create and maintain a sense of clear goals, clear understanding of who the audience is, and clarity concerning audience needs.

If you don't go through the process of answering these questions first, you will never get to the other characteristics of a successful site, such as usable navigation, useful information and relevant information, aesthetics, accessibility, standards, and so forth.

And you do not answer these questions just once. The creators of the site must engage in an ongoing dialogue focused on these five questions, among themselves and with their users, to ensure ongoing success.

### Project and Organizational Goals

Is the relationship to the organization clear in terms of the functionality of the site and how that matches the goals and mission of the institution? Does the institution support the development of the site?

Does the Web site achieve your project goals in the following areas, among others?

- Learning goals
- Financial goals
- Organizational visibility goals

- Political Goals

### Audience Goals

- Have you clearly defined your target audience(s)?
- How well do you know your target audience?
- Once the Web site is up and running, is the audience you have attracted the audience you expected? This is a decision point: Will you adapt your Web site to address the actual audience, or will you step up recruitment and/or adapt the site to attract your intended audience?
- Are your goals the same as your audience's goals? Many times, your known goals are not those of your audience.
- Is the site serving the audience or the institution? Does the site talk about the institution, or does it talk to the audience about the subject of interest?



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*Your Web site is successful based on the degree to which it has met its clearly defined goals.*

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### Point-Counterpoint Thinking

For each criterion, try thinking in terms of point and counterpoint. For example, one criterion might be that the site should keep you from getting lost. The counterpoint would be that it might be cool to get lost.

## Design / Visual Appearance

The visual appearance is important, not just in terms of how it affects people's opinions regarding the credibility of the site, but also to appeal to different audiences. You have to provide different looks if you're trying to attract different people.

## Accessibility

- Does the Web site meet accessibility standards?
- Is the Web site designed to engage diverse learning styles? Does the Web site appeal to multiple levels of users and learners?
- Does the Web site meet the diverse needs of diverse visitors, with multiple tracks for different types and levels of users and learners?
- Is the Web site equally accessible to newcomers and to veteran users?

## Success From the User's Perspective

### Is the Site Self-Evident/Transparent?

Is the function and purpose of the site clear? The site should be self-evident. When you come to a site, you should know where you are and what the purpose is. With good sites, the purpose is transparent. With bad sites, users end up wondering what the purpose of the site is and what they're supposed to do there.

### Can I Find Information Quickly and Easily?

Is the site easy to navigate? Can users find what they want? Is it clear how to get from one point to another?

### Did I Find What I Came Here For?

A site should give people what they are looking for. Google, for example, has an incredibly simple interface, but it is an incredibly popular Web site.



### Is it Visually Appealing?

Aesthetics *do* count. You can visually create space on a Web site that makes people more comfortable and makes them want to participate more.

### What Am I Getting Out of This?

The user should learn something, be able to take something away, or be changed (even in a very small way) by the experience of visiting the site.

### Can I Make an Emotional Connection?

Good sites have some sort of an emotional connection. They engage emotions first, then intellect, and having some sort of emotional hook to the Web site is very effective. That is something that is hard to measure, and it doesn't have to be on a deep or profound level, but there should be some way of connecting with the site on an emotional level.

### Is This Empowering Me In Some Way?

A site that is really successful ultimately empowers the people who are using it on some level.

### Is It Engaging?

On a successful site, users find the site compelling, they are engaged, they are experiencing some form of pleasure or joy in doing things on the site. Is it intellectually engaging? Is it socially engaging? Is it emotionally engaging?

### Does It Respond/React to My Input?

Users should feel that their contribution is meaningful. Does the Web site respond to suggestions or input from users? Does the Web site let users know that it

is responding? If it is just a black box where messages go and nothing ever happens, the users will know you are not really listening.

### **Does it Meet or Exceed My Expectations?**

A successful Web site does not just meet user expectations, it exceeds the expectations of the user and provides unexpected, positive experiences. On the flip side, we do not want to violate the expectations of the user. It is one thing to do something a little different, but if we do something that is wrong that they don't like, it's not helpful.

## **Criteria for Specific Features or Types of Web Sites**

### **Collaborative Process: The Citizen-Science Genre**

A distinction can be made between sites on which people communicate collaboratively and sites on which people work using a collaborative process. The Great Backyard Bird Count site represents more of a collaborative process. In that case, success could be measured by assessing the response to the following questions:

- Does the data have a high degree of quality and quantity?
- Is the data that is collected meaningful and useful to researchers?

The user experience is a little harder to define. Does the site get people actively engaged in the subject matter? Success may be measured by assessing user experience in the following areas:

- Collecting data. In the case of the Great Backyard Bird Count, this would involve identifying birds and getting out in nature.
- Using or looking at the data. Hopefully, the users will feel inclined to go look at the data itself, feeling that they have participated and added to the data and now want to go and try to understand or make meaning from that data.

### **On-Site Discussion Groups**

If discussion groups are present on a site, there are a number of ways to measure their success:

- Are they active?
- Are they relevant and on-topic?
- Do they help to build community?

Signs of lack of success with discussion groups would include:

- Lack of activity
- Inappropriate comments

One example of unsuccessful discussion groups can be found on the Yahoo message boards in the politics section. This is a case in which the communication going on isn't helpful for anybody. Most of the posts are just rants, and it is generally worthless.

### **Successful Interactive Learning Web Sites**

- Did it meet the learning goals?
- What degree of engagement was achieved, both in terms of number of users and in terms of their involvement, which includes both intellectual and emotional engagement?

### **Characteristics of a Site that Empowers and Engages**

Fundamental to success is the empowerment of and engagement with users through characteristics which include:

- Aesthetics
- Sustainability
- Usability
- Usefulness/relevance
- Accessibility
- Integrity/credibility

### Ideas & Questions About Interactive Online Learning

- The experience should change and adapt as the learner goes through the experience. The experience itself should be difficult enough, but not too difficult.
  - An online experience may involve information seeking, or it may involve exploration. The choice to do one or the other (or both) depends on your goals and your audience.
- Is efficiency the most important thing? What are the values surrounding the experience?
  - Scaffolding is appropriate for some kids of learning.
- Discovery and wonder is a form of control.

- Is there feedback to evolve the site to better meet the needs of users?
- Is there feedback within the site to respond to users?
- Is there retention? Do users remember what they did there and come back?
- Does the site move the field forward in some way?
- Is the site responsive to and informed by the field and by similar efforts that have gone before?

### Building Community

Web sites and online experiences are where people are really starting to build their own communities. This may be related to the sense of loss of community in modern life. People are turning to online environments to build a sense of community and have the social exchanges they desire.

- Does the site engage people socially? This allows



you to build based on word of mouth, among family members, and so on.

- Does the Web site appeal to a community with a common interest as a group? For example, there are a group of people interested in bonsai trees. A site could respond to that interest and give them the information they are looking for.

### Going Global

How can a site be effectively global? Have you considered the world as a community while building your site? How do you develop a global community?

One of the challenges is language barriers. An interesting development is that a new global language is emerging. Kids in Japan know what “LOL” means. This new Internet language helps to interpret the meaning of what precedes it. It is its own scaffolding in a way.

### About Content

#### Quality/Process Checks

- Is the authorship of the site content transparent? It should be clear who the author is so that users are able to assess the credibility of the source and the value of your site.
- Does the visual design inform the content (and vice versa)?
- How does the content shape the site?
- Is the design for the user experience appropriate for the content?

## Low Priority as a Problem/Concern

Content is a low priority as a problem or concern in terms of developing a successful Web site. The issue is much more about accessibility than content, and about filters and the architecture of the information.

## Navigation and Site Structure

Does the Web site meet navigation and usability standards?

### In General

- Give visitors good orientation within and about the overall scope and scale of the site.
- Do users understand the context: where they are, what they are doing, and what sort of group they are in?

### More Attention to Usability

There should be more attention to simple usability. Many Web sites are so complicated that they're difficult to use. Features that a younger generation of developers may find cool may indeed be cool, but the average visitor may find the features too complicated or difficult to use.

### A Navigation Structure for Inquiry

- The structure itself should facilitate fluid, unique inquiry paths.
- There should not be dead ends or wrong paths through the site.
- You shouldn't have to always go to the bottom and then bubble your way back to the top again. You

should always feel like you are moving forward in some way or another.

## Evaluation

Is the site being evaluated and monitored? What criteria are being used for evaluation?

Is there both a commitment to and resources for evaluation and subsequent site revision as needed?

### Meeting the Goals

Have the goals that were established for the site been met? To what degree?



## Marketing

“Search will not save you.”

- Off-line promotion and marketing are needed to get the word out and drive people to your Web site.
- You will need a mechanism for attracting repeat visitors, if having repeat visitors is one of your goals.

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*Recruit, Retain, Sustain*

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*Having a specific set of goals and evaluating whether you've accomplished them or not is really what it's all about.*

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### **Measuring Lack of Success**

As soon as you define your Web site, you should think of the measure of unsuccessfulness. How many people have you cut out, including disadvantaged communities or remote communities? You immediately start building boundaries, and as we all know, recovering from mistakes is much more difficult than thinking about and remedying these problems at the start of the process.

### **Hits/Users/Traffic**

People have to go there, including repeat users. One sign of success is the amount of traffic and number of hits or users.

- How much traffic is the site getting?
- How many hits? Do you know if hits are from repeat users?

### **Caveat to the Users-Hits Assessment**

Tallying the number of users has become a generally accepted measure of success, but it is not always an appropriate measure. There could be a really great site that serves a community of teachers with fifty users that is a great success in terms of meeting its stated goals.

The standards of success and measurements used should be tailored to the individual site and to assessing whether or not the specific goals of that site are being met.



### **User Feedback**

Positive user comments, feedback, and satisfaction measures can be used as signs of success.

- Does the site have a mechanism for eliciting user feedback or collecting user satisfaction measures?
- Are you getting positive user feedback? Do users like the site? Do they find it rewarding? Engaging?

### **Sustainability**

This again relates to goals. If your goal is to have a short-lived experience that only lasts for a period of time, then there is no problem if you have only been funded to develop and maintain that Web site for a set period, such as two years.

If your goal is to have a long-lasting community, then you have a problem if you've only got funding for a few years.

Unless the project has short-term goals and the Web site will not be in business long, the following sustainability issues need to be addressed.

### **Meeting New Needs**

Does the Web site have the capacity to adapt and/or grow to meet newly identified user needs?

### **Meaningful Ongoing Change**

- Do you fulfill your commitment to updating content if you have made that commitment to users?
- Does the Web site reflect/incorporate meaningful ongoing change? Does the site evolve as the world

and the subject or content of the site evolve?

- Can the site be maintained, expanded, and updated gracefully and easily if needed?

### Sustainability Questions

- Does the Web site die out after a little while, or can you get your users to fund it by paying for it?
- Can you reach some sort of middle ground in which the popularity of the site that you build allows you to generate future funding?



### A Follow-up Question About Funding for Assessing Impact

- I have a funding question that I have been thinking about regarding the way funders are looking at project impact and which projects to fund. In some projects it may take a longer period of time to see results, and much of what is going to happen in terms of results will happen later on, after the project ends. I was wondering if funders are rethinking the way they fund in this regard. • Sesh Kannan, Principle and Producer, Flaneur Media
- I am going to put it back on you and ask, as a person going to NSF or another funder, have you clearly articulated what you want to do, and why you want to do it, and what its life-span is?

As a case in point, in my other life at the aquarium I had to deal with a funder who wanted to know the impact of my project the day after the project was finished. I argued that there was no way for me to know the impact the next day, because it would be too close to the intervention. I could say something about certain metrics that I started with and how they might change or look a little different at the end, but if I really wanted to get to their question, they needed to fund me eighteen months later to go back and do another study. Only then could I really begin to look at impact. There was a back and forth because they wanted me to say that there would be an increase of X percent the day the grant ended.

So whether it is a program or an experience, part of it is, how have you as the initiator or creator, or you as a group thought about that question? And can you have a dialogue with a potential funder to help them understand what you deem to be reasonable?

I'm not saying that funders don't have their own views of what they want. Obviously, funders have goals too. They fund for purposes that are internal as well as for purposes they think are important for their stakeholders. So some of the challenge is trying to figure out, does what you want to do match with what the funder's ultimate goal is?

It is a dialogue, though I'm not saying there won't be funders who push back and say, "No, we want you to do this." Then your question is, do you capitulate whether it makes sense for your project or not? If you do, then you will have to deal with that later. Or do you decide that it is not going to work with that funder and go elsewhere?

• Julie I. Johnson, Program Director, National Science Foundation

## Thoughts on Success, Impact, Audience, and Access

Julie I. Johnson, Program Director,  
National Science Foundation

### The Attempt at Definition: Murky Waters

I have changed what I'm going to say after listening to the discussions here, which is good because it means I'm responding to the needs of the audience. During my presentation, I am supposed to provide you with something earth shattering and provocative in response to the question, what is success? I don't know if I'll do that, but we'll see.

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*What I didn't hear was a clear understanding of how people were looking at the issue of impact. I heard things like "there would be a lot of traffic." Well, there's a lot of traffic on an expressway.*

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Earlier, you spent a significant amount of time looking at what you thought were characteristics of successful Web sites. I want to touch on that for a minute, but I also want to go back and touch on Sesh Kannan's question about assessing impact. That question really does tie to how you look at what you are doing, and how we as a group define success.

During the presentations about criteria for successful Web sites, I tried to list the points that people were talking about. One common thread that seemed to come out of all of those presentations was the issue of whether there were clear goals on the part of the

developer, the museum, the client, or whoever it was that initiated the Web site. So there was the idea that there should be some clear goals, although it wasn't entirely clear whose goals.

There was some discussion about whether or not the audience is ready-made, or whether you have to create an audience. If you have to create an audience, that has implications, and we will come back to that.

There was the idea that the site should be usable in some way, usually meaning that it would be easy to navigate and easy for participants to get information.

There was also the idea that it should be accessible, and according to the way that I heard it in the various groups, that meant accessible to novices or experts. It wasn't really clear to me that people were talking about universal design and access, and that is another point I will come back to.

There was the idea that it should be appealing on some level. I heard "aesthetics," I heard appealing in terms of relevance, appealing in terms of it motivating people to do something, and in terms of it being engaging.

There was the idea that the experience of the site should exceed the expectations of the user. One question in my mind would be, how do you know? How do you look at that?

Then there was this long series of individual discussions about sustainability, ranging from the question of whether a Web site should be there in perpetuity, to the question of whether it should be finite. And in terms of it being finite, what I heard from a couple of groups was, "Yeah, but even if it's finite you still

want to leave it there, don't you? Isn't there still an obligation?"

So there was the question of sustainability in terms of whatever work is being done, and then sustainability in an archival sense, in that it's there in case, years from now, someone wants to go find it (or in other words, proof that it existed). So I wasn't sure whether sustainability was really about the work that was being done, or about the proof that you did something.

What I didn't hear was a clear understanding of how people were looking at the issue of impact. I heard things like "there would be a lot of traffic." Well, there's a lot of traffic on an expressway. That could be one measure of impact, but if we look beyond traffic to what people are actually doing, then you can ask a question that is perhaps more sticky.

I know that later in this conference there is going to be a discussion of evaluation, but in some respects this gets back to the issue of expectations. Impact implies that you as a group, or you as Web site developers, have thought about what people will do with what is on the Web site. Is there some other level of impact that you want to be thinking about?

I heard something in the earlier discussions about people wanting their site to make people go do other things. How do you know that they're doing other things? I'm not saying this is easy, because it isn't. In fact, it's actually very hard. And it is one of the reasons that the National Science Foundation had an interest in funding this particular conference. We hoped, and I think Rick Bonney and Kathy McLean hoped, that through the collective wisdom in this room we could begin to think about some ways in

which people could wrestle with the question of how you get at impact.

What does impact really mean to you? People have talked about their ultimate Web site and what it would be. I would ask you the corollary question: What do people do with your site and how do you know that they are doing that? So impact is a big question.

Then there is the question of audience. In one of the earlier discussions, people were talking about affinity groups and ready-made audiences, in which case you design your site for a particular group. That has validity, but were there some audiences that you perhaps hadn't considered? If you had considered them, how would that alter the experience you designed?

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*People have talked about their ultimate Web site and what it would be. I would ask you the corollary question: What do people do with your site and how do you know that they are doing that?*

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Or, if you've succeeded in meeting the needs of that really narrow affinity group, have you really succeeded if you haven't considered other groups that could also be part of that? There was some discussion about the fact that we, collectively, are designing for particular sets of groups that already form a club, which led to the question, what about the other eighty percent who are not part of that club?

If the experience you are designing has no ready-made audience, how do you get an audience? How do you nurture the audience? It's really easy, if you are a school or a museum or a gift shop, to see and talk

about who your audience is. As a school or museum, you can design programs for your audience. As a gift shop, you can stock your store with things you know your audience wants. You can track your audience and make sure they are coming back.

What about the customer care and customer nurturing that would have to happen in cyberspace to be able to maintain and track an audience? How do we think about ways we can be more intentional in that?

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*... were there some audiences that you perhaps hadn't considered? If you had considered them, how would that alter the experience you designed?*

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And if there are people for whom written documentation is not their primary means of sharing information, and yet they want to have some experience in accessing the Internet, what does that mean? If there is an audience whose primary form of communication is not written but instead is oral or visual, what does that mean?

When we look at the sites that we have developed and are thinking about developing, and think about the audiences that are apparent, what do we think about the audiences that aren't apparent? Are all of your sites accessible for people who are blind, for example? Do they all have screen readers on them? Are all of your photos captioned, such that if a blind person is using a screen reader they won't get "photo here," but "photo of such and such," with a description?

I think we need to think about that a little bit more. And thinking about that has implications for design and for the care and feeding of both your site and your visitors—as well as yourself, because there is a goal that you had in mind.

Language is another issue that came up earlier. Language is a big thing. It can be used for or against, it can be used to support or to separate and divide. There was some concern about whether or not sites were information-based or dynamic, in that they set up communities or allow the user to create. How does language, or languages, affect the ability of a site to do that?

These are some things I want you to think about in terms of this issue of the overall impact and the question: How do we know that the stuff that we've been doing or the stuff that we intend to do, for our clients or whomever, is really going to do what we say it is going to do? That is my big question. Hopefully, we will have some answers and some more questions by the end of this conference.

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Ongoing Discussion  
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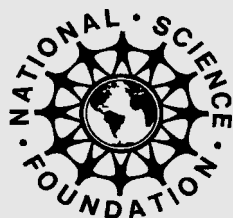
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This document is intended to be a faithful synthesis of the discussions at the Web Designs for Interactive Learning conference that took place at the Cornell Lab of Ornithology in Ithaca, New York on June 15-18, 2005. It is meant to serve as a resource for those who attended and as a resource for others in the field. It does not necessarily reflect the views of the Cornell Lab of Ornithology, the Exploratorium, or individual symposium participants.

In some sections, participant comments have been paraphrased. These are not exact quotes, rather they are an attempt to capture the content and meaning of the ideas presented.



This material is based upon work supported by the  
**National Science Foundation**

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