

# **A Sea Change SMM Adult Programs February, 2011 Evaluation Report**

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## **Introduction**

On November 4, 2010 The Science Museum of Minnesota, in conjunction with Fresh Energy, held a program about ocean acidification. The program included a dinner reception for VIP guests, a screening of the documentary film *A Sea Change*, and a panel discussion about ocean acidification.

*A Sea Change* (<http://www.aseachange.net/>) is a feature-length documentary film about ocean acidification. *A Sea Change* documents Sven Huseby's worldwide search for more information about ocean acidification. Huseby, a retired history teacher, talks with scientists, policy experts, lawyers, business leaders, and people in the green power industry to better understand how and why ocean acidification is happening, its potential impacts, and what can be done to prevent further acidification that could have dramatic impacts on the ocean ecosystem. Huseby's narration is a running dialogue with his young grandson Elias, and he focuses parts of many of his interviews asking experts how they would talk about this topic with children.

Ocean acidification is a by-product of the increasing levels of carbon dioxide in the atmosphere. The ocean and the atmosphere exchange gases; this exchange has moderated the effects of the carbon dioxide released from the burning of fossil fuels. While this has slowed the rate of atmospheric warming, it is affecting the oceans by making them more acidic (carbon dioxide is a weak acid). A more acidic ocean is less hospitable to organisms that make their shells out of carbonate; this could have far reaching impacts on the entire ocean food chain. Despite the far-reaching consequences of ocean acidification, there is very little awareness of the topic.

After the film Sven Huseby, star and co-producer of the film, Barbara Ettinger, director and co-producer of the film, J. Drake Hamilton, science policy director of Fresh Energy – a local organization, and Dr. Richard Feely from NOAA/Pacific Marine Environmental Laboratory, fielded audience members' questions about ocean acidification.

## **Methods**

The film was shown in Discovery Hall, a large meeting space at The Science Museum of Minnesota. Evaluations were distributed at the end of the event. Ninety-two people attended the screening and 78 of them completed the surveys, giving a response rate of 85%. Open-ended responses were analyzed using open coding allowing for emergent themes to be recognized.

## **Results**

Although most attendees reported knowing little (33%) to nothing (30%) about ocean acidification (Table 1), their knowledge levels are much higher than the general public. According to Leiserowitz, Nichols, and Marlon's (2010) survey of the American public, more than three quarters of respondents knew nothing about ocean acidification.

**Table 1: “Before tonight, how much have you read or heard about ocean acidification?”**

	<b>Percent of Audience (n=78)</b>	<b>National Results* (n=2,030)</b>
<b>Nothing</b>	30%	77%
<b>A little</b>	33%	17%
<b>Some</b>	31%	6%
<b>A lot</b>	6%	1%

\*National results from Leiserowitz et al. (2010).

### **How Visitors Heard About A Sea Change**

To better understand how visitors learn about the museum’s adult programs, we asked how visitors hear about this event. Most respondents reported learning about this event from Fresh Energy (53%), referencing communications they had received from the local nonprofit organization about the film (Table 2). A little less than one fifth of respondents (16%) replied that they had heard about it from the science museum’s invitation. Other visitors found from a variety of sources.

**Table 2: How Visitors Heard About A Sea Change (n=75)**

	<b>Percent of Audience</b>
<b>Fresh Energy</b>	53%
<b>SMM invitation</b>	16%
<b>SMM website</b>	3%
<b>Other environmental group or organization</b>	8%
<b>Family, friend or acquaintance</b>	8%
<b>High School Teacher/Science Class/Green Team</b>	5%
<b>Film-makers</b>	4%
<b>Other (college professor and church email)</b>	3%

### **Why Visitors Came to A Sea Change**

Visitors were asked why they came to the event and were given a list of 6 options. Next to each possibility, there was a “yes” box and a “no” box. Each possibility has a different number of respondents because some visitors did not make a selection for each answer (Table 3).

All of the respondents (100%, n=75) agreed that they had come “to see the movie” and that their concern for the environment was a strong motivator for attendance (100%, n=76). Almost all of the visitors came “to hear the speakers” (95%, n=64), were “concerned about ocean acidification” (99%, n=65), and “wanted to learn more about the topic” (99%, n=73). Only a little over half came “to socialize” (55%, n=55).

**Table 3: Why Visitors Came to A Sea Change**

	Percent of Respondents
<b>To see the movie (n=75)</b>	100%
<b>To hear the speakers (n=64)</b>	95%
<b>To socialize (n=55)</b>	55%
<b>I am concerned about the environment (n=76)</b>	100%
<b>I am concerned about ocean acidification (n=65)</b>	99%
<b>I wanted to learn more about the topic (n=73)</b>	99%

### The Film's Content and Tone

To understand participants' reaction to the movie, they were given a series of yes/no questions about their reaction to *A Sea Change*. Not all visitors answered all of the questions; each question has a different number of respondents (Table 4). The majority of people who attended the film thought that “the interviewees seemed credible” (99%, n=76), that “the film would change people’s minds about the seriousness of ocean acidification” (93%, n=70), and that “talking to a child was a good way of presenting this information to adults” (96%, n=75). The movie made people “more aware of ocean acidification” (94%, n=77) and made them “want to do something about” it (95%, n=73). A little under two thirds of visitors said that “the movie made me feel hopeful about the future” (62%, n=68), while almost two fifths of visitors responded that “the movie made me feel hopeless about the future” (37%, n=63). The group of visitors who felt the movie made them feel hopeful about the future was not mutually exclusive from the group who felt the movie made them feel hopeless.

**Table 4: “Thinking about A Sea Change the movie...”**

	Percent of Respondents
<b>I think talking to a child was a good way of presenting this information to adults. (n=75)</b>	96%
<b>I think the film would change people’s minds about the seriousness of ocean acidification. (n=70)</b>	93%
<b>The interviewees seemed credible. (n=76)</b>	99%
<b>Seeing A Sea Change made me more aware of ocean acidification. (n=77)</b>	94%
<b>Seeing A Sea Change made me want to do something about ocean acidification. (n=73)</b>	95%
<b>The movie made me feel hopeful about the future. (n=68)</b>	62%
<b>The movie made me feel hopeless about the future. (n=63)</b>	37%

Visitors were then asked three questions about the tone of the film, addressing its possible emotional, alarming and moralizing aspects. The majority of visitors thought that the film was

appropriately emotional (91%, n=75), alarming (80%, n=76), and moralizing (84%, n=75) for the subject matter (Tables 5, 6, and 7). One fifth of visitors believed that the tone was “not alarming enough” (20%, n=76), 15% thought that it was “not moralizing enough” (n=75), and a little under one tenth of visitors thought that the film was “not emotional enough” (7%, n=75) for the topics covered in the film. Only a few people responded that the film was “too emotional” (3%, n=75) or “too moralizing” (1%, n=75).

***Table 5: “I thought the tone of the movie was...” (Emotional) (n=75)***

	Percent of Audience
<b>Not emotional enough for the subject matter</b>	7%
<b>Appropriately emotional for the subject matter</b>	91%
<b>Too emotional for the subject matter</b>	3%

***Table 6: “I thought the tone of the movie was...” (Alarming) (n=76)***

	Percent of Audience
<b>Not alarming enough for the subject matter</b>	20%
<b>Appropriately alarming for the subject matter</b>	80%
<b>Too alarming for the subject matter</b>	0%

***Table 7: “I thought the tone of the movie was...” (Moralizing) (n=75)***

	Percent of Audience
<b>Not moralizing enough for the subject matter</b>	15%
<b>Appropriately moralizing for the subject matter</b>	84%
<b>Too moralizing for the subject matter</b>	1%

### **Sharing the Film with Others**

Most visitors would share this movie with others (90%, n=76), while only 7% would not. A handful of respondents replied, “it depends” (4%).

Out of those who responded positively to the question above, a majority of visitors said that they would share the movie with either friends and acquaintances (44%) or family (42%) (Table 8). A quarter of visitors said they would share it with youth (27%). Other popular choices included church groups (15%) and anyone (16%). The remaining selections included social groups (4%), co-workers (9%), community groups (7%), business and industry (4%), the government (7%), climate change skeptics (9%), environmental cause supporters (7%), the creative industry (6%), environmental industry (4%), and others (9%).

**Table 8: People with Whom Visitors Would Share A Sea Change (n=55\*)**

	Percent of Audience
<b>Family</b>	42%
<b>Friends and acquaintances</b>	44%
<b>Social groups</b>	4%
<b>Colleagues/co-workers</b>	9%
<b>Church groups/congregations</b>	15%
<b>Community organizations (groups, clubs, libraries, rec. centers)</b>	7%
<b>Business and industry (construction, energy, large power consumers)</b>	4%
<b>Government</b>	7%
<b>Youth (students, the next generation)</b>	27%
<b>Climate Change Skeptics</b>	9%
<b>Environment Cause Supporters</b>	7%
<b>Anyone/everyone</b>	16%
<b>Creative Industry (film makers, Performers, writers)</b>	6%
<b>Environmental Industry</b>	4%
<b>Other</b>	9%

\*Some visitors gave more than one answer, so the percentages do not total 100.

### **Adult Programs at SMM**

Almost all of the people who attended *A Sea Change* thought that the event was worth the cost of attendance. Two thirds of visitors thought that it was “an excellent value for the money” (66%, n=74). A little more than one fourth thought it was “a fair value for the money” (28%), and only 5% thought it was “a poor value for the money”.

Most people had not attended any other adult programs at the museum (57%, n=77). Two fifths responded that they had (42%), while 1% of respondents were unsure if they had attended other programs or not. Everyone was then asked how many programs they had attended.

Unsurprisingly (based on responses to the previous question), most people reported that they have been to zero adult programs other than *A Sea Change* (55%, n=74) (Table 9). One fifth of visitors responded that they had attended 1 or 2 (19%), and a little more than one tenth reported that they had been to 3 or 4 (14%). One tenth of visitors responded that they had been to 5 or more adult programs at the museum (12%).

**Table 9: How many adult programs have you attended at the museum? (n=74)**

	Percent of Audience
<b>0</b>	55%
<b>1 - 2</b>	19%
<b>3 - 4</b>	14%
<b>5 or more</b>	12%

We asked visitors how *A Sea Change* compared to other adult programs at the museum in terms of quality and engagement. Most people responded that it was the first program they had ever attended at the museum (46%, n=70; 52%, n=68) (Tables 10 and 11). Almost two fifths (37%) of visitors thought that the event was of comparable quality with other events, and one third thought that it was comparably engaging (35%). A little more than one tenth (13%) of respondents thought that *A Sea Change* was of “higher quality”(13%) and was “more engaging” than other events (12%). Only a few visitors thought that this event was “less engaging” (1%) and was of “lower quality” (4%) than other events at the science museum.

**Table 10: Event Quality (n=70)**

	Percent of Audience
<b>The event was of lower quality than other events.</b>	4%
<b>The event was of comparable quality to other events.</b>	37%
<b>The event was of higher quality than other events.</b>	13%
<b>This is the first adult program I have attended at SMM.</b>	46%

**Table 11: Event Engagement (n=68)**

	Percent of Audience
<b>This event was more engaging than other adult programming events at the museum.</b>	12%
<b>This event was comparably engaging to other adult programming events at the museum.</b>	35%
<b>This event was less engaging than other adult programming events at the museum.</b>	1%
<b>This is the first event I have attended.</b>	52%

### **Demographics: Membership, Workplace, Climate Change at the Office**

One fourth of visitors had an active membership to the Science Museum of Minnesota (27%, n=77).

Most attendees of the event worked somewhere other than the Science Museum of Minnesota or at Fresh Energy (86%) (Table 12). Science museum employees composed 8% of the audience, while Fresh Energy employees accounted for 6%.

**Table 12: “Where do you work?” (n=73)**

	<b>Percent of Audience</b>
<b>Science Museum of Minnesota</b>	8%
<b>Fresh Energy</b>	6%
<b>Other</b>	86%

The majority of respondents said that they do expend “effort at work [that goes toward] thinking about climate change or environmental issues” (59%, n=75). Two fifths answered that no aspects of their work deal with these issues (41%)

### **Additional Comments about the Event**

At the end of the survey, visitors were asked, “Anything else you would like to add about your experience tonight?” About half of the film’s attendees wrote something in, and most of these comments were reactions to the movie and its content (77%). One fifth of the comments focused on the event or its venue (21%) and another fifth of the responses talked specifically about the panel discussion (18%). One tenth of visitors made comments outside of these themes (12%), often encouraging us to examine our own use of resources. A complete set of visitor responses can be found in Appendix A; below is a brief selection of representative comments.

#### **“Anything else you would like to add about your experience tonight?” (n=35\*)**

\*Some visitors made several comments about the event.

#### **77% (26) Movie Reaction and Content**

- When I remodel my house, I will consider how I may go CO2 free. (A1)
- A bit frustrating so close after the elections.
- Thank you for bringing this here. I would like more people to see this. Would be good for generation of parents/grandparents age.
- How to deal with people who don't respect/honor "science." We live in dangerous times. How to convince the short-term thinkers to think long term? In our economy, how to help individuals to adopt change. We don't have the money to put in solar power even though we want to. Prius-too expensive.

#### **21% (7) Event/Venue**

- The price and the dessert make this event more attractive than the last five or six I have attended in the last 6 to 9 months.
- Please offer car-pooling links when hosting events like this and perhaps offer carbon offsets to travelers.
- Would like to see an interactive display at the Science Museum monitoring their whole energy usage and then taking steps showing how the Science Museum is practicing what they preach and become a teacher and leader in the community.

#### **18% (6) Panel**

- Superlative panel!
- Was good to have the panel of the actual people involved.

#### **12% (4) Other**

- Next time, use double-sided survey papers. The ocean isn't our only resource. (H1)

- Could you present something about global warming that is politically neutral and offers an opportunity for the engagement of groups. Perhaps a show on the diversity of green power solutions. (C2)

Reference:

Leiserowitz, A., Smith, N., & Marlon, J. R. (2010). *Americans' Knowledge of Climate Change*. New Haven, CT: Yale Project on Climate Change Education.



## Appendix A

### Additional Comments About the Event

#### ***“Anything else you would like to add about your experience tonight?” (n=35\*)***

\*Some visitors made several comments about the event.

#### ***77% (26) Movie Reaction and Content***

- It helped me understand more about what we as humans are doing to the ocean.
- Glad to attend. Very informative.
- When I remodel my house, I will consider how I may go CO2 free. (A1)
- Has research been done on extraction of carbon from the seas or CO2 captured and recycled or broken down into its constituent parts? More on the chemistry involved would have been appreciated.
- I brought four high school students and they enjoyed it too.
- Extremely powerful way to tell this story. (B1)
- Fabulous movie! How about having showings for various groups: League of Women Voters, Teacher Conferences, University Film Festival?
- Excellent film.
- A bit frustrating so close after the elections.
- How to deal with people who don't respect/honor "science." We live in dangerous times. How to convince the short-term thinkers to think long term? In our economy, how to help individuals to adopt change. We don't have the money to put in solar power even though we want to. Prius-too expensive.
- What plans do you have for sharing this movie with more people?
- You know, this is hard to comment on, especially as there's only so much room to comment and, more so, my penmanship leaves a lot to be desired. Thinking about A Sea Change? I'm not entirely sure it made me feel hopeful. Well, actually, it -- you know, in every idealist there is a cynic. In the scene in Norway dedicated to wind power the one thing that takes away hope is present. That one thing is a word, the word: profit. Who doesn't like money? Is there any one person who doesn't? Probably somewhere. Ultimately, though? Thing is, people don't really know what profit is. You spend one dollar and get a return of one dollar and one cent. That is profit, but hey, why not get two dollars return? If we do this, which hurts so-and-so, and we do that, which hurts the environment, we can get two dollars return. Why settle for a buck o one when we can get two? It's sad. It's sickening. Sorry, maybe if you can change human nature... If there is, actually is a solution and it's not being applied because it's not profitable, that there's the problem, but then that seems like such a simple answer to a cluster fuck of a problem, so who knows?
- Need to add our reproduction problem; it [the movie] gives false hope of a technological solution. Its blind spot is too large. It doesn't even mention the role of overpopulation in climate change. 9000/hour is our rate of growth, which pushes all carbon production.
- Sobering. A Sea Change is a compelling issue to unite opinion, set goals, motivate action. But good policy (regulations) to encourage market place forces is essential. Poor regulation is a serious detriment to having an essential conversation between all.
- This is scientifically persuasive. (C1)
- Thank you for bringing this here. I would like more people to see this. Would be good for generation of parents/grandparents age.
- Well conceived.

- I like the film but at a few points would have liked it to take a slightly more dramatic tone.
- Thank you!
- I work as an environmental/transportation planner for a suburb of Minneapolis. Thank you for the movie and the panel presentation. (D1&2)
- This was similar to everyone knowing that diet and exercise improve your health. We know "CO2 bad." We even know some of what to do about it-solar/wind/etc., clean tech. However, just knowing doesn't lead to any action. How does one move forward? If this film was meant to change minds, I don't think it was well done. If it was meant to inspire action, it also doesn't point a path forward. I was very disappointed with this film. (E1)
- Good decision to include the child and the scientists. The protagonist was a sympathetic figure. I would want to see what the response to the film would be from conservatives. Is there anything in the film that would be anathema to viewers on the right, I wonder?
- I work for an environmental government agency and much of what I observed from the movie I hope to present to the public.
- I think the film should have provided a bit more science, like maybe information about the ocean food pyramid to show how much a reduction (or decimation) of the pteropod population would affect fish and marine mammal populations and how much that effect might affect human food supply.
- ([I moved the following comment from Q8 to be coded here. SV]: A much shorter version (20 min) would be very helpful for younger students and the general population.) (G2)
- Could this film be shown again and again to the public? (I2)

### **21% (7) Event/Venue**

- The price and the dessert make this event more attractive than the last five or six I have attended in the last 6 to 9 months.
- Please offer car-pooling links when hosting events like this and perhaps offer carbon offsets to travelers.
- Would like to see an interactive display at the Science Museum monitoring their whole energy usage and then taking steps showing how the Science Museum is practicing what they preach and become a teacher and leader in the community.
- Ignorance abounds, even among people who care. Please continue to offer events like this. Please continue to draw other like-minded people together, so that we can share our passions, become more broadly engaged in all areas of sustainability and not just our own. (G1)
- Great event.
- The sound was low on the film; the seats were poorly arranged for a film viewing experience. (A2)
- Next time, have two people with microphones during Q&A. (H2)

### **18% (6) Panel**

- Superlative panel!
- Was good to have the panel of the actual people involved.
- Great breadth of knowledge on the panel. (F1)
- Panelists excellent. (B2)
- I work as an environmental/transportation planner for a suburb of Minneapolis. Thank you for the movie and the panel presentation. (D1&2)
- But the speakers were good. (E2)

### **12% (4) Other**

- Next time, use double-sided survey papers. The ocean isn't our only resource. (H1)
- Is there an exhibit here on this topic? (I1)

- Could you present something about global warming that is politically neutral and offers an opportunity for the engagement of groups. Perhaps a show on the diversity of green power solutions. (C2)
- \*One suggestion - PLEASE print double-sided for future surveys :) (F2)