

Summative Evaluation of  
*Coral Reef Adventure*  
*An IMAX<sup>®</sup> Dome Film*

Report for  
**McGillivray Freeman Films**  
Laguna Beach, California

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# Summative Evaluation of *Coral Reef Adventure* An IMAX<sup>®</sup> Dome Film

## Executive Summary

September 18, 2003

**PROJECT DESCRIPTION** – The summative evaluation reported here focuses on two project components: (1) an IMAX<sup>®</sup> Dome film, titled *Coral Reef Adventure*, and (2) an associated interactive exhibit, titled *Weird, Wild and Underwater*, that is intended to be display in museum and science center lobbies.

**EVALUATION GOALS** – The general goals for this summative evaluation study are to assess the appeal of *Coral Reef Adventure* and the lobby exhibit; acquisition of scientific knowledge and understanding as related to the project’s learning goals and understanding of film topics; and the impact that the exhibit has on viewers of the film.

**EVALUATION DESIGN** – A separate-sample pretest-posttest design was used to evaluate *Coral Reef Adventure* in a natural theater setting with a random sampling of film viewers. This research design was found effective in evaluating the IMAX<sup>®</sup> Dome films *Stormchasers* (Flagg & Johnson, 1996), *Special Effects* (Flagg & Johnson, 1997), *Everest* (Johnson, 1998), and *Dolphins* (Johnson, 2000) and was applied to *Coral Reef Adventure* to add to the baseline knowledge MacGillivray Freeman Films has acquired about the effects of large-format films.

**RESEARCH PROCEDURE** – Surveys were administered to randomly selected audience members either prior to or immediately following showings of *Coral Reef Adventure* at theaters located in St. Paul, Minnesota and San Jose, California. All of the survey respondents were 18 years of age or older. Single adults accompanied by children below the age of five and adults who were part of a group of five or more were excluded.

Data collection efforts were performed at each of the two locations on both weekdays and a weekend day. Questions on the pre- and post-viewing surveys include content questions to measure learning outcomes and questions to assess viewers’ reactions to the film. To gain insight into the impact that the interactive coral reef lobby exhibit has on viewers of *Coral Reef Adventure*, a comparison of learning outcomes was performed between San Jose, which had the exhibit displayed adjacent to the theater’s lobby, and St. Paul, which did not have the exhibit.

Data was collected in St. Paul over the course of 21 showings of the film on July 17-19 (Thursday thru Saturday). The total number of usable surveys collected in St. Paul (N=407) included 202 pre-viewing surveys and 205 post-viewing surveys. Similarly, data was collected in San Jose over the course of 17 showings of the film on July 20-24 (Sunday thru Thursday). The total number of usable surveys collected in San Jose (N=386) included 189 pre-viewing surveys and 197 post-viewing surveys.

Demographics regarding gender, age group, education, occupation (related or not related to science), and number of IMAX<sup>®</sup> and/or OMNIMAX films seen are presented in the report. Analyses revealed that the samples did not differ significantly with respect to these classification variables.

**EVALUATION FINDINGS** – The results summarized below reflect a portion of the findings contained in the body of the report, which contains additional finer-grained findings along with survey respondents’ quoted remarks.

**Prior Interest in Coral Reefs.** Prior to viewing *Coral Reef Adventure*, respondents were asked to rate their interest level in learning about coral reefs. Of the 388 responses received, 73.8% were either “very interested” or “moderately interested.” About 18.8% of responding viewers reported being “a little interested,” and 7.5% of the respondents to this inquiry reported “not interested at all.” On average, respondents in St. Paul gave their interest rating a 2.91 on a four-point Likert scale ranging from 1 (not interested at all) to 4 (very interested). San Jose respondents generally rated their interest as 3.00. On average, the entire pre-viewing sample (St. Paul and San Jose combined) gave their interest in coral reefs a 2.95 rating, with 73.7% describing their interest level as either “very interested” or “moderately interested.”

**Prior Self-Reported Knowledge About Coral Reefs.** Participants in the pre-viewing sample did not report high levels of knowledge about coral reefs prior to viewing the film. Of the 389 members of the pre-viewing sample, 5.4% felt they knew “a lot,” and about one-fourth (23.1%) reported knowing “a moderate amount.” A larger percentage of the pre-viewing sample (62.0%) indicated that they know “a little,” and about 9.5% reported having no knowledge about coral reefs. On average, respondents in St. Paul gave their prior knowledge of coral reefs a 2.33 rating on a four-point scale ranging from 1 (I know nothing) to 4 (I know a lot). San Jose respondents generally rated their prior knowledge as 2.16. On average, the entire pre-viewing sample gave their knowledge about coral reefs a 2.24 rating, with 62.0% indicating they only know “a little.”

**Learning Outcomes.** Both the pre- and post-viewing surveys included a knowledge test to assess understanding of content associated with *Coral Reef Adventure* learning goals. Toward this end, film viewers in St. Paul and San Jose were asked to provide responses to 8 true-or-false and 2 multiple-choice content questions. Correct answers received 1 point. Thus, there is a total of 10 points possible for each survey. Criterion for question selection is based upon a correspondence with film content.

The post-viewing mean achievement score for the St. Paul sample is 8.55, significantly higher than the pre-viewing mean score of 5.39. Thus, the learning outcomes resulting from viewing *Coral Reef Adventure* is statistically significant at this site. More specifically, there was significant improvement on each of the content questions when considered independently.

Similar to St. Paul, the post-viewing mean achievement score for the San Jose sample is 8.26, which is also significantly higher than their pre-viewing mean score of 5.48. There was significant improvement on all content questions for this sample except Question 5 (The rate at which corals appear to be dying is stable/not changing.), when considered independently. Differences between score means for the sample locations was found not to be significant. Thus, there is no significant difference between these samples with respect to learning outcomes.

**Overall, Appeal of Coral Reef Adventure.** On average, respondents in St. Paul gave the film an overall 4.58 rating on a five-point scale ranging from 1 (Very Boring) to 5 (Very Interesting). San Jose respondents generally rated the film as 4.79. On average, the entire post-viewing sample gave their interest in coral reefs a 4.67 rating, with 76.6% of the respondents describing it as “very interesting” and another 17.2% describing the film as “moderately interesting.” Appeal ratings were found to be independent of gender, age group, education, relationship of occupation to science, and number of IMAX<sup>®</sup> films seen.

***The Films' Level of Visual Interest.*** Additionally, viewers were asked to rate how visually interesting or visually boring the film is, overall. On average, respondents in St. Paul gave the film's level of visual interest a 4.57 rating on a five-point scale ranging from 1 (Very Boring) to 5 (Very Interesting). San Jose respondents generally rated the film's visual interest as 4.70. On average, the entire post-viewing sample rated its visual interest as 4.63, with 71.3% of the respondents describing it as "visually interesting."

***The Film's Level of Entertainment.*** Viewers were also asked to rate the film's entertainment value. On average, respondents in St. Paul gave the film's level of entertainment a 4.13 rating on a five-point scale ranging from 1 (Not Entertaining) to 5 (Very Entertaining). San Jose respondents generally rated the film's entertainment value as 4.41. On average, the entire post-viewing sample rated its entertainment value as 4.27, with 45.0% of the respondents describing it as "very entertaining."

***The Film's Pace.*** Viewers responded positively, when asked to rate the pace of the film. In St. Paul, the rating of pace averaged 4.13 on a scale ranging from 1 (too slow) to 5 (too fast). Therefore, with the average of the ratings falling almost exactly between the two extremes, St. Paul survey respondents generally perceived the film's pace to be suitable. Similarly, post-viewing respondents in San Jose gave the film's pace a 3.27 rating, on average. Again indicating its pace is suitable. On average, the entire post-viewing sample rated the film's pace as 3.18, approximately halfway between "too slow" and "too fast."

***Amount of Information Contained in Film.*** On a scale ranging from 1 (too little information) to 5 (too much information), the mean response for the item, "Please rate the amount of information contained in the film" was 3.10 for St. Paul and 3.28 for San Jose. Therefore, with the average of the ratings falling close to halfway between the two extremes, survey respondents at each of these locations generally perceived the amount of information contained in the film to be appropriate. On average, the entire post-viewing sample rated the film's pace as 3.19, approximately halfway between "too little information" and "too much information." Again indicating the amount of information in the film is suitable.

***Meeting Viewers' Expectations.*** Prior to viewing *Coral Reef Adventure*, all members of the pre-viewing sample were asked to describe what they expected to see in the film. Responses to this inquiry were received from a total of 94 individuals at St. Paul and San Jose combined. About 66.3% of the respondents to this inquiry expected to see beautiful underwater scenery/marine life. Similarly, another 21.1% wanted to see underwater scenery/marine life and also expressed an expectation that the film contains information or that they would learn something from viewing *Coral Reef Adventure*. An additional 4.2% of the respondents reportedly expected the film to provide nonspecific entertainment. A similar percentage (2.1%) anticipated seeing state-of-the-art graphics or the enjoyment of experiencing the capabilities of IMAX technology.

Subsequent to seeing the film, members of the post-viewing sample were asked to choose from a selection of four statements the one that best describes how *Coral Reef Adventure* compared with their expectations. Of the 391 responses received, 33.0% indicated that the film had exceeded the viewer's expectations and another 39.6% indicated that the film had met their expectations. The following comments were offered by 5 St. Paul respondents as explanations for why the film had not met their expectations (No explanations were received from San Jose respondents.):

- “It wasn’t as adventurous as other films I’ve seen here.”
- “Not enough action.”
- “Slow pace.”
- “The overt political nature of the film.”
- “Propaganda.”

**What Viewers Like Most About the Film.** After seeing the film, viewers were asked what they liked about *Coral Reef Adventure*, and why. Responses to this inquiry were roughly sorted into the categories that emerged from a review of their comments. The large number of comments identifying multiple film elements that fall within two or more categories defied quantification. Refer to the report for additional information and the entire range of respondents’ quoted remarks.

**What Viewers Like Least About the Film.** After the film, viewers were asked to describe what they like least about *Coral Reef Adventure* and why. A total of 163 viewers provided a response to this inquiry. Responses were sorted into the categories that emerged from a review of their comments. For example, a total of 25 respondents (15.3%) simply wrote the word “nothing” to indicate there is nothing about the film that they didn’t like. This is corroborated by 21 other similarly positive, but more expressive comments (included in the report).

A summary of the other 117 responses is presented and summarized in the report and respondents’ actual remarks are included. In brief, a little over one fourth (26.5%) of the respondents indicated that “not enough information” is their least liked aspect of *Coral Reef Adventure*. Another 14.5% reportedly think that the film is not interesting or wandered off topic. An additional 10.3% of the respondents feel discomfort with the plight of some coral reefs.

**What Surprises Film Viewers.** In order to capture unplanned appeal effects, the post-viewing sample was asked to complete the sentence stem, “I was surprised . . . .” About 39.2% of the respondents to this inquiry were surprised by the plight of coral reefs. Another 24.4% were positively surprised by the film’s presentation of marine life/environment. About 10.1% were surprised by how interesting/enjoyable the film is and 8.3% were surprised by the film’s educational value.

**What Disappoints Film Viewers.** The post-viewing sample was asked to complete the sentence stem, “I was disappointed . . . .” A total of 150 viewers provided a response to this inquiry. Responses were sorted into the categories that emerged from a review of their comments. For example, a total of 32 respondents (21.3%) simply wrote the word “nothing” to indicate there is nothing about the film that disappointed them. This is corroborated by 8 similarly positive, but more expressive comments (included in the report).

A summary of the other 110 responses is presented and summarized in the report and respondents’ actual remarks are included. In brief, 38.2% of the respondents to this inquiry were disappointed by the plight of coral reefs. An equal percentage of respondents (10.0%) were disappointed that solutions to coral reef plight were not shown and that the film was not longer. Another 9.1% were disappointed that there wasn’t more information contained in the film.

**What Confuses Viewers.** When asked, none of the 402 members of the post-viewing sample reported anything about *Coral Reef Adventure* actually being confusing. However, 25 (6.2%) of the viewers did report a desire for additional clarifying information. The broad range of these individuals' remarks are contained in the report.

**The Lobby Exhibit's Impact.** As previously specified, at the time of this study the interactive coral reef exhibit, titled "Weird, Wild and Underwater," was located adjacent to the IMAX theater's entrance lobby in San Jose. In contrast, St. Paul did not have the exhibit.

Both prior to and after seeing *Coral Reef Adventure*, different samples of randomly selected viewers were asked to rate how informative the lobby exhibit is. In spite of the exhibit's prominent location, 82 (43.4%) of the 189 respondents to the pre-viewing survey in San Jose had interacted with the exhibit. Of the 197 post-viewing respondents in San Jose, a fewer 47 (23.9%) reportedly had interacted with the exhibit. For many film viewers, the exhibit was perceived to be a promotional display for the film rather than an interactive exhibit containing learning activities.

On average, pre-viewing respondents in San Jose gave the exhibit an overall 3.61 rating on a five-point scale ranging from 1 (Not Informative) to 5 (Very Informative). Post-viewing respondents generally rated the exhibit's informative value as 4.04. On average, the entire 128 member pre- and post-viewing sample of exhibit users gave it's level of information a 3.77 rating, with 28.9% of the respondents describing it as "very informative."

Viewers were also asked to rate how visually interesting the lobby exhibit is. On average, pre-viewing respondents to this inquiry gave the exhibit a 3.65 rating on a five-point scale ranging from 1 (Visually Boring) to 5 (Visually Interesting). Post-viewing respondents generally rated the exhibit's visual interest as 4.15. On average, the entire pre- and post-viewing sample of exhibit users gave it a visual interest rating of 3.84, with 36.2% of the respondents describing it as "very interesting."

When asked to rate how interesting it is to use spinning wheels to match up images of strange-looking plants and animals with even stranger names, pre-viewing respondents gave this learning activity a 3.23 rating on a five-point scale ranging from 1 (Not Interesting) to 5 (Very Interesting). Post-viewing respondents generally rated the interest level of the wheel matching activity as 3.98. On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 3.50, with 16.0% of the respondents describing it as "very interesting."

The researcher observed that young exhibit users displayed difficulty moving and matching plant and animal images on one wheel with the corresponding name on the other wheel. The spring loaded wheels are difficult for some children to move. Additionally, because the spring mechanism causes the wheels to "snap" into place when moved to a new position, several people's fingers were observed to have been caught between the wheel and the display, resulting in a painful pinch. Each of them immediately walked away from the exhibit. The researcher promptly informed a MacGillivray Freeman representative about this observation.

It was also observed that if you first position an image of a plant or animal on the left wheel, you can then turn the right wheel until a name contained on it matches the selected image, causing a green light to glow rather than a red light. The reverse procedure, however, does not produce the same result. If you first position the right wheel to display a

desired name, turning the left wheel to the matching image will result in the red light glowing rather than the green (correct) light. This appeared to frustrate some exhibit users. The only text that appears on the display with respect to the matching wheels activity is: “Can you match up the reef occupant with its name?”

When asked to rate how interesting it is to interact with the exhibit’s hands-on 3-D display of corals, pre-viewing respondents gave this interactive learning activity a 3.68 rating on a five-point scale. Post-viewing respondents generally rated the interest level of the 3-D display as 4.15. On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 3.86, with 28.6% of the respondents describing it as “very interesting.”

Asked to rate the interest level of reading the exhibit’s list of 5 action items for coral reef conservation, pre-viewing respondents gave this learning activity a 3.99 rating on a five-point scale. Post-viewing respondents generally rated the interest level of the list as 3.83. On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 3.93, with 31.8% of the respondents describing it as “very interesting.”

Asked to rate the interest level of viewing the underwater scenes displayed on the exhibit’s video monitor, pre-viewing respondents gave this activity a 3.99 rating on a five-point scale. Post-viewing respondents generally rated the interest level of the video monitor as 4.04. On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 4.01, with 44.5% of the respondents describing it as “very interesting.”

As previously specified, to gain insight into the impact that the interactive coral reef lobby exhibit has on viewers of *Coral Reef Adventure*, a comparison of learning outcomes was performed between film viewers in San Jose who interacted with the exhibit and film viewers who did not interact with the exhibit. There is not a significant difference between the mean achievement scores across samples. Thus, learning outcomes resulting from interaction with the lobby exhibit are not statistically significant.

# Summative Evaluation of *Coral Reef Adventure* An IMAX<sup>®</sup> Dome Film

September 18, 2003

## Project Description

The summative evaluation reported here focuses on two project components. The first component is a large-format dome film, titled *Coral Reef Adventure*. The film presents the story of a real-life expedition of two underwater filmmakers, Howard and Michele Hall, on a 10-month journey to document some of the world's largest and most beautiful coral reefs. Evaluation efforts, especially the assessment of learning outcomes, gave consideration to the following "big science ideas" addressed by the film:

- Coral reefs are one of the most biologically rich ecosystems on earth, and are the oldest, most complex ecosystems in the sea.
- A coral polyp is an animal which contains symbiotic algae and deposits calcium carbonate.
- Reef animals exhibit extraordinary, intimate behaviors as they engage in mating, feeding, and defense.
- Reef life is tied intimately to naturally occurring cycles of ocean currents and climate.
- Reefs can be remarkably resilient in the face of natural perturbations.
- Reefs can be surprisingly vulnerable to human-caused environmental changes, and ecosystem damage is occurring rapidly.
- Corals are sensitive bio-indicators of overall ocean health and environmental change.
- Scuba and other relatively new technologies enable scientists from a variety of disciplines to conduct reef research and deep sea exploration.
- There is much still to be discovered about coral reefs and how humankind is altering the system.
- Maintaining the biological diversity, condition, and resources of the coral reef ecosystem is a matter of global urgency before current trends become irreversible.

The second project component upon which this summative evaluation focuses is an associated interactive exhibit, titled *Weird, Wild and Underwater*, that is intended to captivate museum/theater visitors by drawing them into the world of coral reefs. The exhibit was designed by the Oregon Museum of Science & Industry (OMSI) for display in museum and science center lobbies. In addition to introducing family audiences to some of the interesting creatures that live on the reef, it also introduces the concept that reefs are endangered, and that each individual can play a part in helping to save coral reefs. The exhibit is approximately 14 feet (long) x 9 feet (high) x 4 feet (deep) when the panels that comprise it are displayed linearly.

## Research Issues and Goals

The general goals for this summative evaluation study are to assess the appeal of *Coral Reef Adventure* and the associated lobby exhibit; acquisition of scientific knowledge and understanding of film topics; and the impact that the exhibit has on viewers of the film. Toward these ends, research methods focused on the following major outcomes:

### The Film

- What do viewers expect to see in the film? Does the film meet viewer expectations?
- To what extent does *Coral Reef Adventure* appeal to general adult viewers (18 years or older)? Is the film's appeal the same for audiences from different regions?
- Do viewers find the film to be visually interesting?
- What is its level of entertainment?
- Is the film's pace suitable?
- Is the amount of information contained in the film adequate?
- Is there anything about the film that viewers find confusing?
- What do viewers like most about the film?
- What do viewers like least about the film?
- What surprises viewers most about the film?
- What disappoints viewers most about the film?
- What are the learning outcomes associated with viewing *Coral Reef Adventure*? What ideas/facts do viewers report learning from the film? Do viewers perceive the film to be a useful resource for information about scientific field research?

### The Exhibit

- How do film viewers rate the *Weird, Wild and Underwater* exhibit's informative value?
- How visually interesting is the exhibit?
- How do exhibit users/viewers rate the following four major components?
  1. Wheels to match plants/ animals with names;
  2. Three-dimensional display of replica corals;
  3. The list of five action items for reef conservation;
  4. Video monitor displaying underwater scenes.
- How do the learning outcomes of film viewers who interacted with exhibit compare with those who didn't?

In accordance with the film's design for viewers of all ages from all walks of life, and the project's major overarching science themes, described below, research procedures, measures, evaluation sites, and target audiences were selected as specified in the following section of this report.

### Major Science Themes

1. *Symbiosis* is a recurring theme throughout the film, used not only to describe the interdependent relationships between corals and zooxanthellae, but also to characterize the relationships between humans and coral reefs, and between the film's cinematographers and scientists.
2. *Interconnectedness* is expressed by the intricate relationships among reef animals, among coral reef, seagrass, and mangrove communities, among coral reefs and coastal communities, and among various countries conducting reef monitoring and conservation projects.
3. *Global change* is evidenced by changes in water quality, level, and temperature, climate change, and increased pressures from human population. These changes can cause a breakdown of the symbiotic, interconnected relationships within the coral reef ecosystem.

### **General Evaluation Design**

As described on the following page, several characteristics of the population and treatment (i.e., the IMAX® film) led to the decision to use the research procedures and measures described in the following section of this report, which Campbell and Stanley (1963) refer to as Design 12.

- First, the population to which we wish to generalize are self-selected museum visitors whose intention is to view an IMAX® Dome film. Locating an equivalent control group who would not view the film was virtually impossible. There were no comparable museum visitors from whom the treatment (the film) could be withheld. The best control group was a sample of museum visitors who intended to view the film, but had not yet done so.
- Secondly, we could not assume that the scientifically predisposed museum visitors would be unfamiliar with the film content, thus it was important to include a pretest that established what the audience knew prior to seeing the film. Pre-testing and post-testing the same sample, however, was not an acceptable procedure, because the pretest almost certainly would sensitize the audience to the content of the film and affect their posttest results. The separate-sample design controls for the main and interactive effects of testing. One group is tested prior to seeing the film and a randomized equivalent group tested after seeing the film.
- Third, random sampling was logistically simple in the theater environment where the audience lines up before show time. Randomization was used to eliminate systematic bias between the pre-viewing sample and the post-viewing sample. As argued by Campbell and Stanley (1963), “the most adequate all-purpose assurance of lack of initial biases between groups is randomization” (Page 25).
- Fourth, the drawbacks of this design, in general, are its failure to control for history, maturation, mortality and the interaction of these. However, in this specific case, where the film treatment is only 40 minutes long and the adult audience is virtually captive, there is little chance of changes in groups due to history, maturation, or mortality; thus, these are non-issues for this evaluation.

In conclusion, the separate-sample pretest-posttest design was considered the strongest approach for evaluating the IMAX® Dome film in a natural theater setting with a random sampling of film viewers. This research design was found effective in evaluating the IMAX® Dome films *Stormchasers* (Flagg & Johnson, 1996), *Special Effects* (Flagg & Johnson, 1997), *Everest* (Johnson, 1998), and *Dolphins* (Johnson, 2000) and was applied to *Coral Reef Adventure* to add to the baseline knowledge MacGillivray Freeman Films has acquired about the effects of large-format films.

## Research Procedures and Measures

Surveys were administered to randomly selected audience members either prior to or immediately following showings of *Coral Reef Adventure* at theaters located in St. Paul, Minnesota and San Jose, California. All of the survey respondents were 18 years or older. Single adults accompanied by children below the age of five and adults who were part of a group of five or more were excluded. As explained below, data collection efforts were performed at each of the two locations on both weekdays and a weekend day.

In St. Paul, members of the pre-viewing survey sample were waiting in a large theater lobby on the ground level of the Science Museum of Minnesota’s William L. McKnight-3M Omnitheater on July 17-19 (Thursday thru Saturday). Post-viewing sample members at this location were asked to respond to a survey as they exited from the upper level of the theater. The show times for *Coral Reef Adventure* at which survey data was collected were in the morning at 11:00 a.m. and in the afternoon at 12:00, 1:00,

2:00, 3:00, 4:00 and 6:00 p.m. Thus, data was collected in St. Paul over the course of 21 showings of the film. The total number of usable surveys collected in St. Paul (N=407) included 202 pre-viewing surveys and 205 post-viewing surveys.

In San Jose, pre-viewing sample members were surveyed on July 20-24 (Sunday thru Thursday) in a small waiting area on the ground level of The Tech's Hackworth IMAX Dome Theater and the post-viewing sample was surveyed while exiting the theater from its upper level. The show times for *Coral Reef Adventure* at which survey data was collected were in the morning at 11:00 a.m. and in the afternoon at 1:30 and 4:00 p.m. on July 20-24, with data being collected at two additional show times (6:00 p.m. and 8:00 p.m.) on July 24. Thus, data was collected in San Jose over the course of 17 showings of the film. The total number of usable surveys collected in San Jose (N=386) included 189 pre-viewing surveys and 197 post-viewing surveys.

Questions on the pre- and post-viewing surveys included content questions to measure learning outcomes and questions to assess viewers' reactions to *Coral Reef Adventure*, as described below.

**Demographic and Background Variables.** The pre-viewing survey established respondents' status with respect to demographic classification variables (gender, age group, education, occupation, and number of IMAX® films seen), background classification variables (pre-viewing expectations, interest, and knowledge associated with the film's topics).

**Film Appeal.** Post-viewing respondents chose one of five scaled statements to indicate how interesting or boring *Coral Reef Adventure* is, overall. Viewers also explained what they liked and did not like about the film and why. They also indicated how the film compared to their expectations. An attempt was made to capture unintended effects by utilizing the completion items: "I was surprised . . ." and "I was disappointed . . .". Using a five-point Likert scale, viewers rated how visually interesting or visually boring the film is; the film's level of entertainment; the pace of the film; and the amount of information contained in the film.

**Comprehensibility.** Film viewers identified anything contained in *Coral Reef Adventure* that they found to be confusing.

**Changes in Interest.** Viewers rated their level of interest in learning about coral reefs both prior to and after seeing *Coral Reef Adventure*.

**Changes in Knowledge.** Both the pre-viewing and post-viewing surveys included a knowledge test to assess understanding of science content associated with the film's viewing goals. Eight true-or-false and two multiple-choice questions comprised a 10-point test about the following topics covered in *Coral Reef Adventure*. The questions/statements and correct answers drawn from the film's content appear below.

	<u>Correct Answer</u>
1. All coral is a type of plant.	False
2. The Grand Coral Reef is the name of the world's largest coral reef.	False
3. Ocean warming is a major cause of coral reefs dying.	True
4. Living coral can be found at depths greater than 300 feet.	True
5. The rate at which corals appear to be dying is stable/not changing.	False
6. Cooperation between marine species sustains life in a coral reef.	True
7. Diversity in marine life stresses/weakens a coral reef.	False
8. Algae is driven out of corals by a 2° centigrade increase in water temp.	True

9. How do mangrove trees effect coral reefs?  
 A. Their roots produce toxic waste that harms corals.  
 B. Their roots protect coral by trapping silt.  
 C. They produce chemicals that bleach coral white.  
 D. They have no effect on coral.
10. There is microscopic algae that lives inside coral. How does this effect the coral? D  
 A. Their roots produce toxic waste that harms corals.  
 B. Their roots protect coral by trapping silt.  
 C. They produce chemicals that bleach coral white.  
 D. They have no effect on coral.

To gain insight into the impact that the interactive coral reef lobby exhibit, titled “Weird, Wild and Underwater,” has on viewers of *Coral Reef Adventure*, a comparison of learning outcomes was performed between San Jose, which had the exhibit displayed adjacent to the theater’s lobby, and St. Paul, which did not have the exhibit.

## Demographics

Demographics regarding gender, age group, education, occupation (related or not related to science), and number of IMAX® and/or OMNIMAX films seen for St. Paul and San Jose are summarized in Table 1. Note that the distribution of these variables by percentage of sample for the two sites is approximately equal, except for a slightly larger percentage of survey respondents who are 48 years of age or older in the San Jose sample. In contrast, a larger percentage of respondents in the St. Paul sample have viewed three or more IMAX® films.

Table 1. Demographic Variables for St. Paul and San Jose

Variable	Categories	St. Paul, MN		San Jose, CA	
		Pre-Viewing (N=202)	Post-Viewing (N=205)	Pre-Viewing (N=189)	Post-Viewing (N=197)
Gender	Female	108 (53.5%)	95 (46.3%)	94 (49.7%)	112 (56.9%)
	Male	94 (46.5%)	89 (43.4%)	95 (50.3%)	76 (38.6%)
	Not Specified	–	21 (10.2%)	–	9 (4.6%)
Age Group	18-27	60 (29.7%)	55 (26.8%)	58 (30.7%)	47 (23.9%)
	28-37	32 (15.8%)	36 (17.6%)	39 (20.6%)	38 (19.3%)
	38-47	57 (28.2%)	41 (20.0%)	35 (18.5%)	42 (21.3%)
	48+	46 (22.8%)	45 (22.0%)	53 (28.0%)	56 (28.4%)
	Not specified	2 (1.0%)	28 (13.7%)	4 (2.1%)	14 (7.1%)
Education	Some High School	13 (6.4%)	5 (2.4%)	6 (3.2%)	11 (5.6%)
	High School	45 (22.3%)	45 (22.0%)	39 (20.6%)	35 (17.8%)
	College	73 (36.1%)	81 (39.5%)	66 (34.9%)	66 (33.5%)
	Grad./Prof. School	40 (19.8%)	53 (25.9%)	47 (24.9%)	56 (28.4%)
	Other	31 (15.4%)	15 (7.3%)	26 (13.8%)	9 (4.6%)
	Not specified	–	6 (2.9%)	5 (2.7%)	16 (8.1%)
Occupation	Related to science	67 (33.2%)	61 (29.8%)	68 (36.0%)	55 (27.9%)
	Not related to science	133 (65.8%)	134 (65.4%)	114 (60.3%)	139 (70.6%)
	Not specified	2 (1.0%)	7 (3.4%)	5 (2.7%)	3 (1.5%)
IMAX Films Viewed	This is the first film	9 (4.5%)	17 (8.3%)	29 (15.3%)	37 (18.8%)
	One other film	12 (5.9%)	16 (7.8%)	37 (19.6%)	20 (10.2%)
	2 or 3 other films	68 (33.7%)	28 (13.7%)	22 (11.6%)	57 (28.9%)
	4 or more other films	113 (55.9%)	139 (67.8%)	101 (53.4%)	79 (40.1%)

\*Totals may not equal exactly 100.0% due to rounding.

Gender, age group, education, occupation, and IMAX film viewing demographics for the entire sample (i.e., St. Paul and San Jose combined) are summarized in Table 2.

Note that for the sample as a whole, the classification variables of gender, age group, education, occupation, and number of IMAX® films seen were fairly equally distributed across the categories. The distribution of the combined sample on these classification variables is presented below.

Table 2. Combined Demographic Variables

Variable	Categories	Pre-Viewing (N=391)	Post-Viewing (N=402)
Gender	Female	202 (51.7%)	207 (51.5%)
	Male	189 (48.3%)	165 (41.1%)
	Not Specified	–	30 (7.5%)
Age Group	18-27	118 (30.2%)	102 (25.4%)
	28-37	71 (18.2%)	74 (18.4%)
	38-47	92 (23.5%)	83 (20.7%)
	48+	99 (25.3%)	101 (25.1%)
	Not specified	6 (1.5%)	42 (10.5%)
Education	Some High School	19 (4.9%)	16 (4.0%)
	High School	84 (21.5%)	80 (19.9%)
	College	139 (35.6%)	147 (36.6%)
	Grad./Prof. School	87 (22.3%)	109 (27.1%)
	Other	57 (14.6%)	24 (6.0%)
	Not specified	5 (1.3%)	22 (5.5%)
Occupation	Related to science	135 (34.5%)	116 (28.9%)
	Not related to science	247 (63.2%)	273 (67.9%)
	Not specified	7 (1.8%)	10 (2.5%)
IMAX Films Viewed	This is the first film	38 (9.7%)	54 (13.4%)
	One other film	49 (12.5%)	36 (9.0%)
	2 or 3 other films	90 (23.0%)	85 (21.1%)
	4 or more other films	214 (54.7%)	218 (54.2%)

\*Totals may not equal exactly 100.0% due to rounding.

Information from demographic and background questions was used to determine whether the randomization worked well in equalizing the pre and post-viewing groups and whether the two independent samples should be looked at as having come from the same population. Chi-square analyses revealed that the samples did not differ significantly with respect to the classifications of gender, age group, education, occupation (connection with science), or number of IMAX® films seen prior to viewing *Coral Reef Adventure*.

## Evaluation Findings

Findings obtained from randomly selected audience members prior to and immediately following their viewing of *Coral Reef Adventure* at theaters located in St. Paul, Minnesota and San Jose, California are reported below. Pre- and post-viewing survey results include respondents feedback about the film and its associated interactive exhibit, titled *Weird, Wild and Underwater*.

**Prior Interest in Coral Reefs.** Prior to viewing *Coral Reef Adventure*, respondents were asked to rate their interest level in learning about coral reefs. Of the 388 responses received, 73.8% were either “very interested” or “moderately interested.” About 18.8% of responding viewers reported being “a little interested,” and 7.5% of the respondents to this inquiry reported being “not interested at all.” Table 3 shows that, on average, respondents in St. Paul gave their interest rating a 2.91 on a four-point Likert scale ranging from 1 (not interested at all) to 4 (very interested). San Jose respondents generally rated their interest as 3.00. On average, the entire pre-viewing sample (St. Paul and San Jose combined) gave their interest in coral reefs a

2.95 rating, with 73.7% describing their interest level as either “very interested” or “moderately interested.”

Table 3. Pre-Viewing Interest in Learning About Coral Reefs

Variable	Categories	St. Paul (N=199)	San Jose (N=189)
Interest	Very interested	37 (18.6%)	75 (39.7%)
	Moderately interested	114 (57.3%)	60 (31.7%)
	A little interested	40 (20.1%)	33 (17.5%)
	Not interested at all	8 (4.0%)	21 (11.1%)
Average		2.91	3.00

**Prior Self-Reported Knowledge About Coral Reefs.** Participants in the pre-viewing sample did not report high levels of knowledge about coral reefs prior to viewing the film. Of the 389 members of the pre-viewing sample, 5.4% felt they knew “a lot,” and about one-fourth (23.1%) reported knowing “a moderate amount.” A larger percentage of the pre-viewing sample (62.0%) indicated that they know “a little,” and about 9.5% reported having no knowledge about coral reefs. Table 4 shows that, on average, respondents in St. Paul gave their prior knowledge of coral reefs a 2.33 rating on a four-point scale ranging from 1 (I know nothing) to 4 (I know a lot). San Jose respondents generally rated their prior knowledge as 2.16. On average, the entire pre-viewing sample gave their knowledge about coral reefs a 2.24 rating, with 62.0% indicating they only know “a little.”

Table 4. Pre-Viewing Self-Reported Knowledge About Coral Reefs

Variable	Categories	St. Paul (N=202)	San Jose (N=187)
Knowledge	I know a lot.	13 (6.4%)	8 (4.3%)
	I know a moderate amount.	48 (23.8%)	42 (22.5%)
	I know a little.	133 (65.8%)	108 (57.8%)
	I know nothing.	8 (4.0%)	29 (15.5%)
Average		2.33	2.16

\*Totals may not equal exactly 100.0% due to rounding.

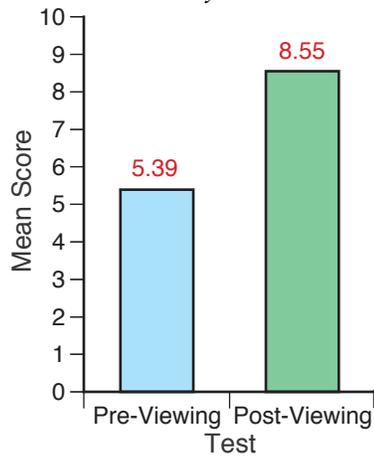
**Learning Outcomes.** Both the pre- and post-viewing surveys included a knowledge test to assess understanding of content associated with *Coral Reef Adventure* learning goals. Toward this end, film viewers in St. Paul and San Jose were asked to provide responses to 8 true-or-false and 2 multiple-choice content questions. Correct answers received 1 point. Thus, there is a total of 10 points possible for each survey. Criterion for question selection is based upon a correspondence with film content. The questions drawn from film content appear below.

1. All coral is a type of plant.
2. The Grand Coral Reef is the name of the world’s largest coral reef.
3. Ocean warming is a major cause of coral reefs dying.
4. Living coral can be found at depths greater than 300 feet.
5. The rate at which corals appear to be dying is stable/not changing.
6. Cooperation between marine species sustains life in a coral reef.
7. Diversity in marine life stresses/weakens a coral reef.
8. Algae is driven out of corals by a 2° centigrade increase in water temp.
9. How do mangrove trees effect coral reefs?
10. There is microscopic algae that lives inside coral. How does this effect the coral?

The post-viewing mean achievement score for the St. Paul sample is 8.55 [SD (standard deviation) = 1.60], significantly higher than the pre-viewing mean score of 5.39 [SD = 1.89], as tested by a pooled t-test,  $t(405 \text{ df}) = 18.23, p \leq 0.0001$ . Thus, the

learning outcomes resulting from viewing *Coral Reef Adventure* is statistically significant. Figure 1 presents the St. Paul mean scores for the pre- and post-viewing content questions.

Figure 1. Distribution of St. Paul Mean Achievement Scores for Pre- and Post-Viewing Content Questions



As previously specified, on average, the St. Paul sample had significantly improved scores on the post-viewing test, compared to their pre-viewing results, overall. Table 5 reveals that, more specifically, there is also significant improvement on each of the content questions when considered independently.

Table 5. St. Paul Pre- and Post-Viewing Test Data Summary

Question Number	N	Pre-Viewing* Correct (Mean)	N	Post-Viewing* Correct (Mean)	Mean Difference	Statistical Significance**
1	199	102 (.51)	196	132 (.67)	+ .16	$p = .0011^{***}$
2	198	102 (.52)	195	143 (.73)	+ .21	$p \leq .0001^{***}$
3	202	128 (.63)	203	193 (.95)	+ .32	$p \leq .0001^{***}$
4	195	147 (.75)	204	190 (.93)	+ .18	$p \leq .0001^{***}$
5	198	164 (.83)	205	187 (.91)	+ .08	$p = .0119^{***}$
6	199	187 (.94)	202	198 (.98)	+ .04	$p = .0384^{***}$
7	201	109 (.54)	204	157 (.77)	+ .09	$p \leq .0001^{***}$
8	198	98 (.50)	205	191 (.93)	+ .11	$p \leq .0001^{***}$
9	196	76 (.39)	202	184 (.91)	+ .07	$p \leq .0001^{***}$
10	196	75 (.38)	201	178 (.89)	+ .14	$p \leq .0001^{***}$

\* Number of correct answers and mean (i.e., average score) for each question

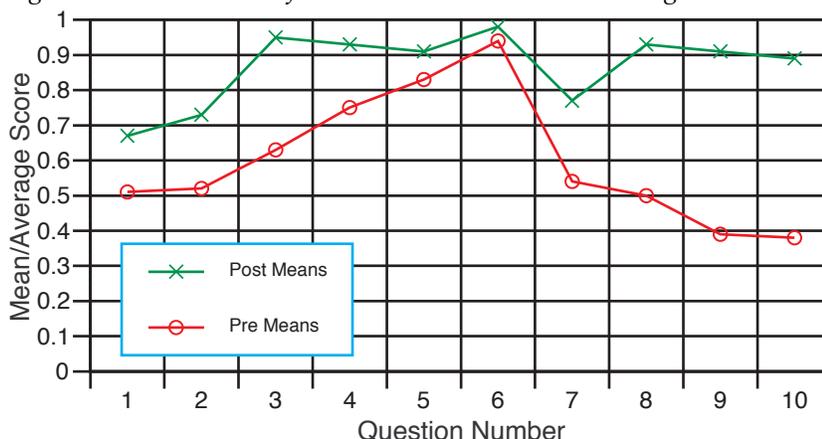
\*\* Pooled t-Test

\*\*\* Statistically significant at the .05  $p$  level (i.e., 95% confidence level)

A  $p$  level  $\leq .05$  indicates a treatment affect occurred (i.e., post-viewing score is significantly higher or lower than pre-viewing score. See sign in difference column for direction.)

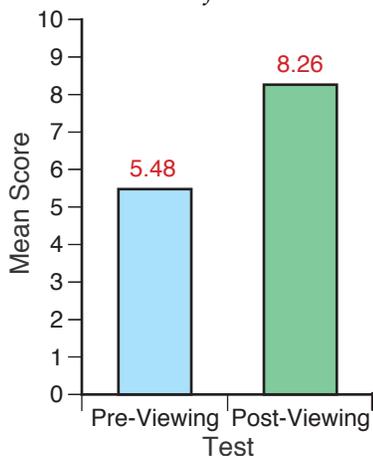
Figure 2 presents a chart showing the differences between pre- and post-use mean/average scores for each of the 10 content questions.

Figure 2. Distribution of St. Paul Pre- and Post-Viewing Mean Scores



Similar to St. Paul, the post-viewing mean achievement score for the San Jose sample is 8.26 [SD = 1.75], which is significantly higher than the pre-viewing mean score of 5.48 [SD = 1.79], as tested by a pooled t-test,  $t(384 \text{ df}) = 15.49, p \leq 0.0001$ . Figure 3 presents the mean scores for the San Jose pre- and post-viewing content questions. A two-way ANOVA (analysis of variance) on pre- and post-viewing scores was calculated for the two sample locations (St. Paul, MN and San Jose, CA) to discern if there is a significant difference between them with respect to correct content question responses. Differences between score means for the sample locations was found not to be significant:  $F(2, 790) = 0.6887, p = 0.4069$ . Thus, there is no significant difference between these samples with respect to learning outcomes.

Figure 3. Distribution of San Jose Mean Achievement Scores for Pre- and Post-Viewing Content Questions



As previously specified, on average, the San Jose sample had significantly improved scores on the post-viewing test, compared to their pre-use results, overall. However, as shown in Table 6 on the following page, there was significant improvement on all content questions except for Question 5 (The rate at which corals appear to be dying is stable/not changing.), when considered independently.

Table 6. San Jose Pre- and Post-Viewing Test Data Summary

Question Number	N	Pre-Viewing* Correct (Mean)	N	Post-Viewing* Correct (Mean)	Mean Difference	Statistical Significance**
1	176	86 (.49)	195	124 (.64)	+ .15	$p = .0042^{***}$
2	172	72 (.42)	192	131 (.68)	+ .26	$p \leq .0001^{***}$
3	181	129 (.71)	195	182 (.93)	+ .22	$p \leq .0001^{***}$
4	182	112 (.62)	194	169 (.87)	+ .25	$p \leq .0001^{***}$
5	183	146 (.80)	194	166 (.86)	+ .06	$p = .1379$
6	183	159 (.87)	196	189 (.96)	+ .09	$p = .0007^{***}$
7	185	98 (.53)	194	152 (.78)	+ .25	$p \leq .0001^{***}$
8	184	109 (.59)	194	184 (.95)	+ .36	$p \leq .0001^{***}$
9	174	49 (.28)	189	171 (.91)	+ .63	$p \leq .0001^{***}$
10	171	75 (.44)	194	160 (.83)	+ .39	$p \leq .0001^{***}$

\* Number of correct answers and mean (i.e., average score) for each question

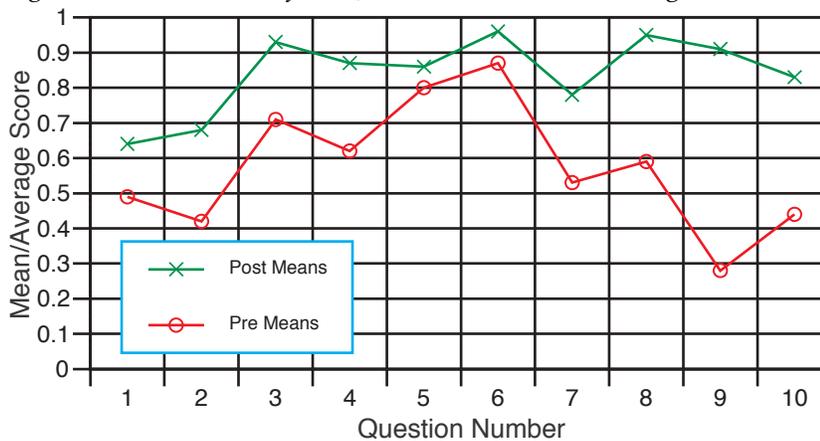
\*\* Pooled t-Test

\*\*\* Statistically significant at the .05  $p$  level (i.e., 95% confidence level)

A  $p$  level  $\leq .05$  indicates a treatment affect occurred (i.e., post-viewing score is significantly higher or lower than pre-viewing score. See sign in difference column for direction.)

Figure 4 presents a chart showing the differences between pre- and post-viewing mean/average scores for each of the 10 content questions.

Figure 4. Distribution of San Jose Pre- and Post-Viewing Mean Scores



**Overall Appeal of Coral Reef Adventure.** After seeing the film, respondents were asked to rate how interesting or boring *Coral Reef Adventure* is. Table 7 (on the following page) shows that, on average, respondents in St. Paul gave the film a 4.58 rating on a five-point scale ranging from 1 (Very Boring) to 5 (Very Interesting). San Jose respondents generally rated the film as 4.79. On average, the entire post-viewing sample gave their interest in coral reefs a 4.67 rating, with 76.6% of the respondents describing it as “very interesting” and another 17.2% describing the film as “moderately interesting.”

Table 7. Post-Viewing Rating of Overall Appeal of Film

Variable	Categories	St. Paul (N=205)	San Jose (N=196)
Appeal	Very Interesting	143 (69.8%)	165 (84.2%)
	Moderately Interesting	47 (22.9%)	22 (11.2%)
	Okay	9 (4.4%)	8 (4.1%)
	Moderately Boring	3 (1.5%)	1 (0.5%)
	Very Boring	3 (1.5%)	–
Average		4.58	4.79

\*Totals may not equal exactly 100.0% due to rounding.

Appeal ratings were found to be independent of gender, age group, education, relationship of occupation to science, and number of IMAX® films seen.

**The Film’s Level of Visual Interest.** Viewers were asked to rate how visually interesting or visually boring the film is, overall. On average (See Table 8), respondents in St. Paul gave the film’s level of visual interest a 4.57 rating on a five-point scale ranging from 1 (Very Boring) to 5 (Very Interesting). San Jose respondents generally rated the film’s visual interest as 4.70. On average, the entire post-viewing sample rated its visual interest as 4.63, with 71.3% of the respondents describing it as “visually interesting.”

Table 8. Rating the Film’s Level of Visual Interest

Variable	Rating/Category	St. Paul (N=205)	San Jose (N=196)
Visual Interest	5 (Visually Interesting)	135 (65.9%)	151 (77.0%)
	4	55 (26.8%)	36 (18.4%)
	3	11 (5.4%)	5 (2.6%)
	2	4 (2.0%)	3 (1.5%)
	1 (Visually Boring)	–	1 (0.5%)
Average		4.57	4.70

\*Totals may not equal exactly 100.0% due to rounding.

**The Film’s Level of Entertainment.** Viewers were also asked to rate the film’s entertainment value. On average (See Table 9), respondents in St. Paul gave the film’s level of entertainment a 4.13 rating on a five-point scale ranging from 1 (Not Entertaining) to 5 (Very Entertaining). San Jose respondents generally rated the film’s entertainment value as 4.41. On average, the entire post-viewing sample rated its entertainment value as 4.27, with 45.0% of the respondents describing it as “very entertaining.”

Table 9. Rating the Film’s Level of Entertainment

Variable	Rating/Category	St. Paul (N=205)	San Jose (N=195)
Level of Entertainment	5 (Very Entertaining)	80 (39.0%)	100 (51.3%)
	4	84 (41.0%)	80 (41.0%)
	3	34 (16.6%)	11 (5.6%)
	2	1 (0.5%)	3 (1.5%)
	1 (Not Entertaining)	6 (2.9%)	1 (0.5%)
Average		4.13	4.41

\*Totals may not equal exactly 100.0% due to rounding.

**The Film's Pace.** Viewers responded positively, when asked to rate the pace of the film (See Table 10). In St. Paul, the rating of pace averaged 4.13 on a scale ranging from 1 (Too Slow) to 5 (Too Fast). Therefore, with the average of the ratings falling almost exactly between the two extremes, St. Paul survey respondents generally perceived the film's pace to be suitable. Similarly, post-viewing respondents in San Jose gave the film's pace a 3.27 rating, on average. Again indicating its pace is suitable. On average, the entire post-viewing sample rated the film's pace as 3.18, approximately halfway between "too slow" and "too fast."

Table 10. Rating the Film's Pace

Variable	Rating/Category	St. Paul (N=203)	San Jose (N=197)
Pace of the Film	5 (Too Fast)	2 (1.0%)	8 (4.1%)
	4	37 (18.2%)	48 (24.4%)
	3	146 (71.9%)	132 (67.0%)
	2	14 (6.9%)	7 (3.6%)
	1 (Too Slow)	4 (2.0%)	2 (1.0%)
Average		3.09	3.27

\*Totals may not equal exactly 100.0% due to rounding.

**Amount of Information Contained in Film.** Reportedly, the post-viewing sample thinks that the amount of information presented in *Coral Reef Adventure* is appropriate. On a scale ranging from 1 (too little information) to 5 (too much information), the mean response for the item, "Please rate the amount of information contained in the film" was 3.10 for St. Paul and 3.28 for San Jose (See Table 11). Therefore, with the average of the ratings falling close to halfway between the two extremes, survey respondents at each of these locations generally perceived the amount of information contained in the film to be appropriate. On average, the entire post-viewing sample rated the film's pace as 3.19, approximately halfway between "too little information" and "too much information." Again indicating the amount of information in the film is suitable.

Table 11. Rating the Amount of Information in the Film

Variable	Rating/Category	St. Paul (N=203)	San Jose (N=195)
Amount of Information	5 (Too much information)	8 (3.9%)	9 (4.6%)
	4	43 (21.2%)	55 (28.2%)
	3	122 (60.1%)	117 (60.0%)
	2	22 (10.8%)	10 (5.1%)
	1 (Too little information)	8 (3.9%)	4 (2.1%)
Average		3.10	3.28

\*Totals may not equal exactly 100.0% due to rounding.

**Meeting Viewers' Expectations.** Prior to viewing *Coral Reef Adventure*, all members of the pre-viewing sample were asked to describe what they expected to see in the film. Responses to this inquiry were received from a total of 94 individuals in St. Paul and San Jose combined. These responses can be roughly grouped into the 5 categories specified in Table 12. Note that 66.3% of the respondents to this inquiry expected to see beautiful underwater scenery/marine life. Similarly, another 21.1% wanted to see underwater scenery/marine life and also expressed an expectation that the film contains information or that they would learn something from viewing *Coral Reef Adventure*. An additional 4.2% of the respondents reportedly expected the film to provide nonspecific entertainment. A similar percentage (2.1%) anticipated seeing

state-of-the-art graphics or the enjoyment of experiencing the capabilities of IMAX technology.

Table 12. Rating the Amount of Information Contained in the Film

Variable	Categories	Responses (N=95)
Expectations	Underwater scenery / marine life	63 (66.3%)
	Underwater scenery and information	20 (21.1%)
	Nonspecific entertainment	4 (4.2%)
	Graphics	2 (2.1%)
	IMAX experience	2 (2.1%)
	Miscellaneous remarks	4 (4.2%)

The following are respondents' actual pre-viewing descriptions of what they expected to see in *Coral Reef Adventure*, subdivided into the categories specified in Table 10, above:

#### Beautiful Underwater Scenery

- "An underwater world."
- "Underwater scenes of nature."
- "Underwater footage, a film with an environmental edge, person story. Beautiful scenery."
- "Beautiful scenes."
- "Views not possible by any other means."
- "Great underwater scenes and coral life that you never see on television."
- "Coral reef and water."
- "The ocean."
- "The majesty of life on, in and around the coral reef."
- "Expanses of coral reefs, wildlife, possibly places I'd like to visit."
- "A coral reef."
- "Coral reefs."
- "Corals, water."
- "Underwater life and growth of coral and decline of coral reefs."
- "Coral reefs, animals and water."
- "Coral reefs and the animals that live in them or benefit from them; besides man."
- "Tour through a coral reef—scuba, snorkeling without the water."
- "Close view of the Australian coral reef. I am excited."
- "Coral, fish, conservation, rhetoric."
- "Water, corals, submarines, crustaceans."
- "Colorful underwater scenes."
- "Underwater beauty."
- "Outstanding underwater pictures."
- "Underwater life."
- "Underwater scenes of tropical fish, formation of coral reefs, inhabitants of reefs."
- "I think I will see fish, coral and..."
- "Fish, coral, scuba-divers, islands, etc."
- "To see fish, the underwater coral reefs."
- "I expect to see lots of animals (sea turtles) and lots of colors."
- "Finding NEMO AKA fish."
- "I expect to see an excellent movie on the topic."
- "A lot of interesting shots of coral reefs in exotic places."
- "Undersea facts I don't already know."
- "Just as it was."
- "Australian coral reef. Divers moving around. Formation of corals."
- "Waves, marine life feeding, breeding."
- "A coral reef, water, fish."
- "Fish." [5 references]

- *"Lots of fish."*
- *"Fish, coral."*
- *"Colorful fish."*
- *"Pretty fish and scenery."*
- *"Fish, sharks."*
- *"I want to see sharks."*
- *"Sharks, coral reefs, old people."*
- *"Sharks, beautiful scenery, current information about the reefs."*
- *"Sea urchins, starfish, various marine life."*
- *"I want to see sharks."*
- *"I expect to see sharks, fishes and the coral reefs. I also expect to see a lot of underwater footage."*
- *"Close up under the sea life."*
- *"Underwater scenery and fish."*
- *"Underwater animals, coral reefs."*
- *"The multitude of different fish and living coral."*
- *"Coral reef creatures, diving."*
- *"I expect to see the various species that live in the coral reef and learn how they interact and co-exist in that environment."*
- *"I have either scuba dived or snorkeled in many reefs around the world. I expect today at this movie to take me to those reefs and feel like I'm there. I hope it's not too elementary or I'll have wasted my time, but I expect it to be really good with colorful and exotic fish, sea ferns, sponges, corals."*
- *"Interesting new life forms I have never seen."*
- *"I am waiting to find out. Definitely fish and water."*

#### Beautiful Scenery and Information

- *"Colorful but informative description of Coral Reef."*
- *"To find information on the coral reef. I am interested."*
- *"The coral reef, the science and explanations of it. The marine life that interacts with the reef and their relationship to it. Lots of visually stunning images."*
- *"To learn about coral reefs and see some beautiful underwater pictures."*
- *"To learn about how coral reef affects its habitants. I concur to reach an adequate level of knowledge of coral reefs."*
- *"A great learning experience for my 8 year-old son."*
- *"Learn more about the coral reef and be entertained with colors and images."*
- *"Detailed description both visually and audibly."*
- *"How the coral reefs are doing."*
- *"What is happening in terms of conservation with the coral reefs."*
- *"Formation and need for conservation of coral reefs."*
- *"I hope to learn about what the type of life that exists in a coral reef, what breaks it down and how to keep the reef from deteriorating."*
- *"I expect to see the beauty of the ocean, lots of fish and unknown spaces I've never heard about."*
- *"I expect to see a lot of things in the ocean. I expect to learn a lot more about the coral reef than I know now."*
- *"I'm really interested in marine life."*
- *"Documentary on formation and lifecycle."*
- *"Footage of scuba dives in coral reefs around the world, information about their state and conservation efforts."*
- *"Be entertained, see beauty, learn about reefs."*
- *"A learning and fun experience of the Coral Reef. Lots of color and beauty."*
- *"Information about them and their beauty—ways to help preserve the reefs."*

### Nonspecific Entertainment

- “Pure entertainment, beautiful photography.”
- “Neat stuff.”
- “Fun.”
- “In depth color, excitement.”

### Graphics

- “State of the art graphics.”
- “Cool graphics.”

### IMAX Experience / Technology

- “A wonderful real life experience in what I have heard is the best IMAX theatre around.”
- “An adventure brought about by the technology of film.”

### Miscellaneous Remarks

- “Just new things, I don’t really expect much.”
- “Relive some diving experiences of Monterey and Hawaii.”
- “Well – I’ve already seen it.”
- “I’ve already seen it.”

Subsequent to seeing the film, members of the post-viewing sample were asked to choose from a selection of four statements the one that best describes how *Coral Reef Adventure* compared with their expectations. Of the 391 responses received, 33.0% indicated that the film had exceeded the viewer’s expectations and another 39.6% indicated that the film had met their expectations. Table 13 shows similar results for both St. Paul and San Jose, with the exception that 9.3% of the respondents in St. Paul indicated their expectations had not been met, compared to 1.6% of the respondents in San Jose who expressed a similar sentiment.

Table 13. How the Film Compared With Viewer Expectations

Variable	Categories	St. Paul (N=204)	San Jose (N=187)
Meeting Expectations	The film exceeded my expectations.	63 (30.9%)	66 (35.3%)
	The film met my expectations.	77 (37.8%)	78 (41.7%)
	The film did not meet my expectations.	19 (9.3%)	3 (1.6%)
	I had no expectations before seeing the film.	45 (22.1%)	40 (21.4%)

\*Totals may not equal exactly 100.0% due to rounding.

The following comments were offered by 5 St. Paul respondents as explanations for why the film had not met their expectations:

- “It wasn’t as adventurous as other films I’ve seen here.”
- “Not enough action.”
- “Slow pace.”
- “The overt political nature of the film.”
- “Propaganda.”

No explanations were received from San Jose respondents.

**What Viewers Like Most About the Film.** After seeing the film, viewers were asked what they liked most about *Coral Reef Adventure*, and why. Of the 391 viewers who were asked this question 305 (78%) provided an answer. Responses were roughly sorted into the categories that emerged from a review of their comments.

The large number of comments identifying multiple film elements that fall within two or more categories defied quantification. For example, a large majority

of the feedback received praised the photography/cinematography in addition to complementing the film's educational value and/or its music/sound track. Consequently, while these comments could easily have been categorized as "photography/visually appealing," the inclusion of a reference to elements such as "music/sound track" or "informative/educational" resulted in their being included in these categories to set them apart from comments that were exclusively about the film's photography or visual appeal. This overlapping of ideas was also encountered when respondents made references to such things as coral and fish, in addition to other elements such as the film's cinematography, music, etc. In order to convey the true nature and tone of viewers' feedback, their actual written remarks are included below, rather than reducing them to a table containing an itemized count of unique words. As noted, some responses could arguably have been included in one or more other categories.

#### Photography/Visually Appealing (N=101)

- *"Absolute outrageous photography."*
- *"Visually and graphically captivating."*
- *"Beautiful photography, great dive sites."*
- *"Photography of animals and reef."*
- *"Fabulous photography."*
- *"Beautiful photography, great dive sites."*
- *"The photography was excellent."*
- *"Beautiful underwater photography."*
- *"Great photography."*
- *"The photography."*
- *"Photography, something you do not get to experience in the life we live."*
- *"Underwater photography."*
- *"Loved the photography – and seeing all the different reef locations."*
- *"Various angles/perspectives the reefs were viewed at."*
- *"Views were amazing."*
- *"Cinematography."*
- *"I enjoyed the visuals very much."*
- *"The visual aspect."*
- *"Great visually, very interesting, good variety of reefs."*
- *"I liked the visual effects as they gave insight to the depths of the ocean."*
- *"Visually appealing."*
- *"Visuals, problems/solutions to reefs."*
- *"The visuals were wonderful."*
- *"Visually, it was amazing and colorful, the movement was great."*
- *"Spectacular scenes of ocean fish and coral."*
- *"The scenery was wonderful."*
- *"The imagery was pretty remarkable."*
- *"Visuals."*
- *"The pictures were very pretty."*
- *"Good pictures."*
- *"The spectacular views."*
- *"I liked the stunning imagery."*
- *"Images of coral, fish, movement."*
- *"The images were impressive, how did they film it?"*
- *"The beauty. A well delivered message."*
- *"Beautiful."*
- *"Loved seeing the beautiful colors."*
- *"Color and seeing new different places."*
- *"The color."*

- *"Colors."*
- *"Beautiful color."*
- *"Beautiful fish and colors."*
- *"The beautiful fish and colors."*
- *"I loved the cinematography."*
- *"Beautiful photography, color vivid, informative about oceans."*
- *"Beautiful photography of the colorful corals."*
- *"Amazing photography."*
- *"Photography."*
- *"Great photography."*
- *"Reef photos."*
- *"Some nice photos."*
- *"Good video footage."*
- *"We enjoyed the visuals, the colors everything about the movie. It was very interesting."*
- *"There were great pictures! I have never seen a coral reef and would like to; this shows you what it looks like."*
- *"It was very educational and inspires you to want to help. Beautiful photography."*
- *"Pictures were great."*
- *"All the amazing pictures."*
- *"Pictures from a place I have never been."*
- *"It was so beautiful; pictures one couldn't otherwise ever see."*
- *"The footage."*
- *"The use of animation and film shots (mapping the adventure)."*
- *"Great filming of different types of coral reefs."*
- *"Visually stimulating, one day I would like to experience them myself."*
- *"Excellent graphics, photography, easy to understand."*
- *"Transition from computer graphics to live action explained reasons for reef destruction."*
- *"The scenery was very good. The stark contrast between living and dead coral reefs became a lot more understandable."*
- *"The vibrant scenes of the coral reefs and the fish populations."*
- *"Scenery – like I was there."*
- *"Tropical visual scenes."*
- *"Visuals."*
- *"Visual impact."*
- *"The visual entertainment."*
- *"Extreme cool visual effects." Loved the going from the map to the ship."*
- *"The images were outstanding."*
- *"The visual variety and unusual scenery."*
- *"Visual effects"*
- *"Very visually pleasing."*
- *"Great visuals."*
- *"Wonderful view of the deep ocean."*
- *"Imagery and use of animation to show time passage."*
- *"Gorgeous."*
- *"Beauty."*
- *"It was beautiful."*
- *"Beautiful pictures of places."*
- *"It was beautiful."*
- *"Underwater shots."*
- *"The color – the positive feeling that the reefs can recover."*
- *"The color of the reef and the fish."*
- *"Vibrant colors."*
- *"Everything, the cool colors most."*
- *"Colors, I have never seen a coral reef, it was almost like being there."*

- *"The visual aspect of technology in movies."*
- *"Good pacing, colorful images, shots were not held too long."*
- *"Different views under sea."*
- *"I got a glimpse of the ocean floor I would never have otherwise seen."*
- *"Flying sensation, colors."*
- *"Great Arial views."*
- *"Arial views."*
- *"Great views."*
- *"I really enjoyed the views."*
- *"Scenery."*

#### Informative/Educational (N=72)

- *"I learned a lot of what I did not know."*
- *"The scientific information, because I am a biology teacher."*
- *"Very entertaining and informative."*
- *"Very informative and enjoyable."*
- *"It was very informative."*
- *"Everything – very informative."*
- *"Information."*
- *"I like the information it provided and how it helped me become more aware."*
- *"Very informative and did it in a very interesting way."*
- *"Very informative. I learned a lot."*
- *"Very informative, great pictures."*
- *"Information given, because I learned a lot which made me more interested in learning even more."*
- *"Beautiful photography and I learned a lot."*
- *"Photography, explanation, very informative."*
- *"Very informative, visually beautiful and inspiring."*
- *"Photography. Learned a lot, but in an entertaining and sincerely presented way."*
- *"Good information; colorful."*
- *"I liked all the information it gave you because I want to do that when I get older."*
- *"Pointed out real problems, causes and encouraged helpful responses."*
- *"The film is very interesting and helps give people basic information on saving reefs, how they benefit, science and medicine."*
- *"The color, music, information."*
- *"Very scientific and informative."*
- *"Educational."*
- *"Educational and beautiful."*
- *"Educational and entertaining."*
- *"The photography was very impressive, but I most enjoyed the educational aspect. The importance of preserving our environment."*
- *"I thought it was very visually beautiful, it also provided good information."*
- *"It was educational, beautiful, great music, wasn't depressing the whole time but gave about the right amount of concern."*
- *"Better understanding of how what we do on land affects the sea."*
- *"Important reef information."*
- *"Showing what happens when we don't take care of the environment."*
- *"I liked how they included how to save the reefs as well as how they were needing help."*
- *"They listed 3 reasons reef is dying; warming, logging, over fishing."*
- *"Learned much! This is good as I would like to help preserve nature."*
- *"Very beautiful. The information was very good too."*
- *"I am a diver and learned a lot about the problems and possible solutions."*
- *"It not only is visually exciting and impressive, but it also points out how damaging global warming is to the earth."*
- *"Clarity, depth of information."*

- *"I liked the manner in which the information was presented, it was inspiring."*
- *"I loved all of the pictures and the information given because I learn more when I see things that I'm learning about."*
- *"I liked that it increased awareness of the reef's state."*
- *"Expanding the knowledge of coral reef importance."*
- *"I liked the facts about coral."*
- *"I gained experience and knowledge."*
- *"I liked all the information I picked up so I can help save coral reefs."*
- *"Educational info about coral reef health."*
- *"I learned a lot about things I didn't know existed."*
- *"It taught me a lot about the reefs."*
- *"Learning how coral reefs die."*
- *"Now it is educating people why coral reefs need our help."*
- *"Information on how to save reefs."*
- *"New knowledge."*
- *"Very informative."*
- *"Very informative."*
- *"Very informative."*
- *"Very informative, visually beautiful and inspiring."*
- *"Educational."*
- *"Visual and educational."*
- *"I got to know a lot of things about sea life. It was amazing."*
- *"It tells you about interesting stuff."*
- *"I liked information, liked pace and liked visual map showing areas."*
- *"Loved learning about the science. Good maps."*
- *"The ship map thing."*
- *"The great variety of corals and other living things, filled in some gaps in my knowledge of them."*
- *"Good message and education."*
- *"I've snorkeled different places and learned a lot from your film."*
- *"Information on importance of Global warming and forest cutting."*
- *"I learned how the reefs function and what to look for."*
- *"So colorful – educating."*
- *"It was very colorful and informative. It was very interesting as well."*
- *"People should be aware of coral reef and this films helps."*
- *"Didn't realize coral was beneficial in healing human bone."*

#### Music/Sound Track (N=25)

- *"Music."*
- *"Music."*
- *"Music."*
- *"Visual effects, music, lesson on loving life."*
- *"Great colorful underwater shot and great background music."*
- *"Very interesting, music was well choreographed."*
- *"The best part was the sound track. I'm a huge CSN fan."*
- *"Great music, great images."*
- *"Music, narration, flying."*
- *"Music, awesome scenery, views of coral reef."*
- *"Great music to go with the action, great colors."*
- *"Visually appealing, good music."*
- *"Yea, Crosby Stills & Nash."*
- *"Colorful – cool music."*
- *"The music – very appropriate."*
- *"The music and the zest for life portrayed therein."*
- *"Music and different camera angles."*

- *"I liked the way the words to some music came to life with the animals actions."*
- *"Information, music."*
- *"The message of Teach Your Children Well."*
- *"Music, visuals, it was fun, lively."*
- *"The fun sound effects were great."*
- *"Loved the colors and the music."*
- *"I loved the graphics and the sound effects."*
- *"Visual of reefs and music."*

#### Coral (N=21)

- *"The beautiful fish and coral."*
- *"Beautiful pictures of coral."*
- *"The color, variety of fish – I'm a diver and felt like I was there."*
- *"I liked seeing all the fish because they were interesting."*
- *"All the fish and how they live."*
- *"I really loved all the fish and coral. I liked learning how they all work together."*
- *"It had a lot of creatures and was underwater."*
- *"I liked the shark shots, because I've never seen anything like that before."*
- *"I thought it was beautiful and interesting."*
- *"I like coral reefs."*
- *"All the beautiful coral."*
- *"Coral detail."*
- *"Seeing the living coral reef."*
- *"Underwater, the reef."*
- *"All of the color and different types of coral. I was clueless about coral before this movie."*
- *"To see the beautiful diversity of the coral reefs makes you appreciate how important they are and how much we have yet to learn about them."*
- *"I like coral reefs."*
- *"I liked the coral that was healthy and beautiful."*
- *"I liked seeing the different varieties of coral."*
- *"The reefs were beautiful."*
- *"The corals of course and the fish because they are colorful."*

#### Fish (N=18)

- *"Diversity of fish."*
- *"The different fish."*
- *"I liked the fish because I've never seen them before."*
- *"The fish were cool."*
- *"Octopus, they are not featured in most underwater films."*
- *"The look of the fish."*
- *"It had lots of great fish because there are great in the coral reefs."*
- *"Fish."*
- *"The fish were pretty."*
- *"I liked it all because I really like fish."*
- *"I liked seeing how the fish interacted because it is just like some humans."*
- *"Interesting sea creatures."*
- *"I liked all of the different kinds of fish."*
- *"Great fish shots."*
- *"I liked the fish."*
- *"I liked seeing all the fish and sea creatures."*
- *"The bulldozer shrimp because it showed how two different species help each other."*
- *"It was very colorful, very beautiful fish."*

### Protecting/Preserving Environment (N=13)

- *"To protect the future sea warming."*
- *"Need to reserve our resources."*
- *"Pertinent since the U. S. government didn't sign the Kyoto accords."*
- *"The emphasis on "change now" or it will be too late."*
- *"Motivating, reminder to take better care of the earth."*
- *"Beautiful things are precious and it conveyed that."*
- *"Very clear narration and excellent photography. Makes people aware of the concerns of global warming and deforestation."*
- *"Pro-environmentalism with awesome sights."*
- *"Very interesting and made me aware of the many problems around the world that the coral reefs have."*
- *"Without dwelling on the issue of global warming it did convey the point."*
- *"How it is affected by us."*
- *"Bringing to light the problem of dying reefs."*
- *"Colors of reef and preservation message."*

### Everything (12)

- *"Everything."*
- *"Everything."*
- *"Everything."*
- *"The whole thing."*
- *"All."*
- *"Very much."*
- *"I liked everything, it makes me want to do that."*
- *"I liked everything because it is a great and interesting subject to learn about."*
- *"I liked everything about it, it's new to me and very interesting."*
- *"I liked everything about the Coral Reef Adventure because I found it very interesting."*
- *"I liked everything, it's interesting."*
- *"All of the underwater adventures, they were interesting."*

### Sharks (N=11)

- *"The school of reef sharks."*
- *"All the sharks."*
- *"Sharks, color."*
- *"Sharks."*
- *"The sharks."*
- *"Sharks made the reefs look pretty."*
- *"The sharks swarming in the underwater canyon."*
- *"I liked seeing the sharks swimming, because that's something that you don't see unless you scuba dive."*
- *"Sharks were neat."*
- *"Sharks, interesting."*
- *"The shark and the 350 foot dive, I would love to do that."*

### Interesting Film (N=9)

- *"Very interesting and colorful."*
- *"Very interesting and pretty colors."*
- *"It was interesting."*
- *"It was interesting."*
- *"I loved it. It is very interesting."*
- *"How they found new animals because it's interesting. Beautiful color and exotic places."*
- *"Covered the topic in a manner that appealed to both me and my children."*
- *"The subject was intensifying."*
- *"It's an experience the average person never has."*

### Miscellaneous Comments (N=23)

- *"Very interesting."*
- *"It was good."*
- *"It brought me to places I would never get to see otherwise."*
- *"I'm a scuba diver."*
- *"The deep dive was special."*
- *"Flying scenes-entertaining."*
- *"Of course the "vertigo" sensation."*
- *"The reasons why they made the film."*
- *"Covered many areas, not just Great Barrier."*
- *"It showed a lot."*
- *"When the diver allowed an organism to go into her mouth, it was funny."*
- *"The frequent changes of pace."*
- *"When I went to Hawaii I snorkeled and was sad to see a dying reef."*
- *"It features our greatest treasures."*
- *"Thinking how much fun it would be to study coral reefs for a living."*
- *"I like the fact that they can cure diseases. Could you mention cancer?"*
- *"It was colorful and fun to visit varied sites. I felt like I had a short vacation."*
- *"You got to see things that the average person does not get to see in a lifetime."*
- *"The diving."*
- *"Stimulates our interest in diving."*
- *"Fascinating, kept my attention."*
- *"I found unknown life to us fascinating."*
- *"It didn't make me too dizzy."*

**What Viewers Like Least About the Film.** After the film, viewers were asked to describe what they like least about *Coral Reef Adventure* and why. A total of 163 viewers provided a response to this inquiry. Responses were sorted into the categories that emerged from a review of their comments. For example, a total of 25 respondents (15.3%) simply wrote the word "nothing" to indicate there is nothing about the film that they didn't like. This is corroborated by the following 21 (12.9%) similarly positive comments:

- *"There is nothing I didn't like."*
- *"Nothing I didn't like."*
- *"Nothing really, because it was all interesting."*
- *"Nothing, I liked everything."*
- *"Nothing wrong."*
- *"None, very good."*
- *"Nothing! I loved this film."*
- *"I loved everything."*
- *"I loved it all."*
- *"I liked everything."*
- *"I liked everything. Wonderful film!"*
- *"Liked everything. Excellent job."*
- *"I liked everything in the film."*
- *"Liked it all."*
- *"There isn't anything I didn't like, it was a great show."*
- *"I liked it."*
- *"Interesting."*
- *"It expanded my awareness."*
- *"There's really not a part of the film I would change. All things being equal it was a great show."*
- *"No dislikes."*
- *"Nothing except maybe it's not long enough."*

A summary of the other 117 responses is presented and summarized in Table 14. Respondents' actual remarks are included following the table. Note that a little over one fourth (26.5%) of the respondents indicated that "not enough information" is their least liked aspect of *Coral Reef Adventure*. Another 14.5% reportedly feel that the film is not interesting or wandered off topic. An additional 10.3% of the respondents feel discomfort with the plight of some coral reefs.

Table 14. What Viewers Liked Least About the Film

Variable	Categories	Responses (N=117)
Liked Least	Not enough information	31 (26.5%)
	Not interesting/wandered off topic	17 (14.5%)
	Viewer discomfort with plight of reefs	12 (10.3%)
	Motion discomfort	8 (6.8%)
	Sound was too loud	6 (5.1%)
	Film is too short	5 (4.3%)
	Social commentary	5 (4.3%)
	Not enough action	4 (3.4%)
	Some scenes are too "fast"	4 (3.4%)
	Miscellaneous comments	25 (21.4%)

Respondents' actual comments describing what they liked least about the film are presented below to convey the nature of their thoughts.

#### Not Enough Information (N=31)

- "I wanted more information about the fish and other sea animals."
- "Could use more information, slightly preachy without enough back up, documentation."
- "Too little biological information."
- "More information on how to help or get involved."
- "Not enough information. What can I do?"
- "Could go more in depth on many topics."
- "More information about the coral type, for example, names and what types of fish live in each type."
- "Not scientific enough on how many reefs have been lost."
- "Overall the music is very good but perhaps a bit more explanation of the bends to fully understand why it is so dangerous."
- "The people, and the story. The information seemed incomplete. The story didn't seem whole."
- "How will the hero in the film stop the logging? Is it only the responsibility of poor countries like Fiji to save the environment? What role can/should countries like the USA play? These are issues that I believe the film could have attempted at least to raise if not answer."
- "Simplistic discussion of ecological issues."
- "Needed to highlight and spend some more time on how development and conservation can happen together."
- "Too much soupy personal info. on children, not enough education."
- "A synopsis of what the adventure would entail – we didn't find out until the end that they were there for 10 months or that there was a limitation of time."
- "Should have more exotic creatures and information on them."
- "Could have contained more information."
- "Explaining fish and how to help out."
- "I would like more information on whether results have been seen from human efforts to save reefs."
- "Would have liked to know more about the different species."
- "More info. on the different types of animals and then names that live in the sea."
- "Would have liked more fish identified."

- *"Too little information; didn't learn much."*
- *"Not enough information."*
- *"Film did not explain how reefs were formed."*
- *"Not enough information on how to stop it."*
- *"Solutions to the reefs health were limited."*
- *"No solutions, speculative."*
- *"More time would have allowed going into more detail, e.g. the last atoll with the sharks – is that all there was to it?"*
- *"I wanted to see more sea turtles and more about what the Fijians do for coral reefs."*
- *"If education is also intended as well as entertainment, perhaps something in writing or a questionnaire at the end like this is helpful for memory; otherwise it is just entertainment."*

#### Not Interesting / Wandered Off Topic (N=17)

- *"Story not engrossing enough."*
- *"The part about the decompression chamber was off topic and boring."*
- *"There was some unnecessary commentary."*
- *"There was too much information and it became slightly boring."*
- *"The beginning where it gives information on the reef, is rather boring."*
- *"Didn't really care about the people."*
- *"The part that did not show the ocean was a little boring."*
- *"Personalities of the stars."*
- *"Too much people shots."*
- *"I did not like the time spent on how the man's wife was really sad during her husband's illness. I don't like it when people cry."*
- *"I didn't like the actors; too cheesy"*
- *"To much focus on specific people."*
- *"It got repetitive in some parts."*
- *"It was too much like a boat ride."*
- *"It was a little confusing."*
- *"There was almost too much talk."*
- *"Hang gliding not really about the subject of coral reefs."*

#### Viewer Discomfort With Plight of Reefs (N=12)

- *"I didn't like what was happening to the reefs."*
- *"The dead coral."*
- *"A bit depressing."*
- *"The part that showed the dead reef."*
- *"That coral reefs are dying."*
- *"I did not like how much the reefs are being damaged, but I know that is not the filmmakers fault."*
- *"Upsetting that it is dying, would like to help."*
- *"It was sad that the reef is dying."*
- *"That everything was dying."*
- *"Didn't like reef dying."*
- *"It is sad to think there may be no solution."*
- *"Depressing."*

#### Motion Discomfort (N=8)

- *"Fast movement (motion sickness)."*
- *"Motion made me dizzy at times."*
- *"I have a hard time with flying sequences."*
- *"It was a little too close. I felt a bit seasick."*
- *"Made me seasick."*
- *"Motion sickness."*
- *"I got a little dizzy at the end, but the length of the movie was good."*
- *"There were times when the scenery went by to fast, and made me dizzy."*

#### Sound Was Too Loud (N=6)

- *"Sound too loud."*
- *"The sound was too loud."*
- *"Sound too loud."*
- *"Sound too loud. Tone down about 15%."*
- *"Perhaps a bit loud for me anyway."*
- *"I did not like the volume of the soundtrack in some scenes (too loud)."*

#### Film Is Too Short (N=5)

- *"Too short."*
- *"Too short."*
- *"All too short, so much more could be said about the subject."*
- *"Would have like it to be longer."*
- *"Too short, would have loved to see more."*

#### Social Commentary (N=5)

- *"I support environmental issues, but found this film too preachy."*
- *"Social commentary."*
- *"Why this film was used for overt propaganda to promote radical environmentalism."*
- *"Offensive political lies, sympathetic approach to liberal causes."*
- *"The sickening non-stop preaching."*

#### Not Enough Action (N=4)

- *"Needed more action."*
- *"Not much moving."*
- *"A little slow paced."*
- *"A little slow."*

#### Some Scenes Are Too "Fast" (N=4)

- *"Not enough time spent slowly enjoying the beautiful reef. Too much editing."*
- *"Some scenes were too fast."*
- *"Sometimes the action was too fast."*
- *"The fast filming."*

#### Miscellaneous Comments (N=25)

- *"More movement in forward perspective; allows me to feel as though I am there."*
- *"The main point of focus was clear, however the parafoil views were extremely blurry."*
- *"More aerial photos."*
- *"Need some cool fish."*
- *"I didn't get a sense of passage of time until the end."*
- *"I would have enjoyed more IMAX quality underwater."*
- *"More unique fish up close."*
- *"Follow-up in a few years to see if the reef lives."*
- *"Commercial."*
- *"For me, it was a little below my knowledge level, but I'm a science teacher and a diver. I think it would be excellent for my high school kids though."*
- *"Make it a little more simple for non biology students."*
- *"The song Teach Your Children Well – played too much."*
- *"About the man almost dying."*
- *"That 80's song when they dove really deep."*
- *"Sound system didn't seem the crispest – the CSN music was a little overbearing at times."*
- *"Music too low."*
- *"Hokey sound effects. Shoot the movie. Include music. Drop the fake sounds."*
- *"Sounds fake."*
- *"Too many hokey pictures."*
- *"No clown fish."*
- *"Too much water."*

- “Not enough brilliant colors.”
- “There were a few places where there were bugs on the camera lens.”
- “Sitting in the second row from the bottom.”
- “Seats should tilt back a bit more.”

**What Surprises Film Viewers.** In order to capture unplanned appeal effects, the post-viewing sample was asked to complete the sentence stem, “I was surprised . . . .” The 217 responses to this inquiry were sorted with keywords and the number of responses in each mutually exclusive category are presented in Table 15. About 39.2% of the respondents to this inquiry were surprised by the plight of coral reefs. Another 24.4% were positively surprised by the film’s presentation of marine life/environment. About 10.1% were surprised by how interesting/enjoyable the film is and 8.3% were surprised by the film’s educational value.

Table 15. What Surprises Film Viewers

Variable	Categories	Responses (N=217)
Liked Least	Plight of coral reefs	85 (39.2%)
	Marine life/environment	53 (24.4%)
	An interesting/enjoyable film	22 (10.1%)
	Film’s educational value	18 (8.3%)
	IMAX capabilities	9 (4.2%)
	Depth of dives	4 (1.8%)
	Film’s music score	3 (1.4%)
	Social commentary	2 (0.9%)
	Miscellaneous comments	21 (9.7%)

\*Totals may not equal exactly 100.0% due to rounding.

Respondents’ actual comments describing what surprised them about *Coral Reef Adventure* are presented below to convey the nature of their thoughts.

#### Plight of Coral Reefs (N=85)

- “How easily damaged they can be.”
- “To see how the reefs changed.”
- “To here that reefs around the world are dying.”
- “That end is so near.”
- “To learn how quickly our reefs were diminishing.”
- “The rapid decrease in the health of the reef.”
- “At how fast the reefs are dying.”
- “That many reefs are being destroyed.”
- “By the devastation of reefs in Fiji.”
- “At the amount of damage being done to the reefs.”
- “By how much coral reef is destroyed.”
- “That so many reefs were dying.”
- “A whole reef would die.”
- “By the destruction of the reefs.”
- “How much danger the reefs are in.”
- “To learn they could disappear by 30 years.”
- “At how easy it was to damage the reef.”
- “About how global warming is so destructive.”
- “To see how coral reefs change because of the temperature.”
- “How fast the ocean is changing.”
- “At the rate at which waters are warming.”
- “At how quickly a reef can be lost.”
- “How fast the reef is dying.”
- “That sedimentation could devastate a reef.”

- *"To learn about the effects of silt on reefs."*
- *"What logging can do to reefs."*
- *"That humankind is killing so much coral as it pursues wealth."*
- *"At ecosystem reliability on all parts."*
- *"To see the dead coral."*
- *"Starkness of dead reefs."*
- *"At the destruction."*
- *"At how wide spread the destruction is."*
- *"Reefs are so endangered."*
- *"About the endangerment of reefs."*
- *"At how many reefs are dying."*
- *"At the rate that the coral is dying, and at how fast the current moves. Amazing."*
- *"How colorful the reefs were and that lack of rainforests causes destruction. It's amazing how just a few degree temp. Change affects so much. Politicians argue over a few degrees, but I wish they all knew of the effects."*
- *"That coral reefs actually die."*
- *"That coral is dying."*
- *"That reefs are dying."*
- *"At all of them dying."*
- *"At how reefs are dying."*
- *"That the reefs were dying."*
- *"About the reef dying."*
- *"That the reefs were dying."*
- *"That the coral reefs are dying."*
- *"That the reef was dying."*
- *"That they were dying."*
- *"That the coral reef was dying."*
- *"At it's destruction."*
- *"That the coral reefs are in such danger."*
- *"To learn the reefs were in such trouble."*
- *"About the coral problems."*
- *"Of how endangered the coral reefs are."*
- *"At the condition of the coral."*
- *"At the amount of coral that has died."*
- *"That there were so many reefs dying."*
- *"To see how much the coral reef is dying."*
- *"That coral reefs will die in 30 years."*
- *"That in 30 years the coral reefs could be gone."*
- *"In 30 years it could all be gone!"*
- *"By how fast a reef can die."*
- *"To find out that corals are dying at a fast rate."*
- *"That coral reefs are dying to quickly."*
- *"To see the dead coral reef."*
- *"To see the dead sea floor."*
- *"To see the dead coral reefs."*
- *"At the huge loses we will suffer in so little time if corals are not preserved."*
- *"The amount of reef death."*
- *"How such subtle changes in temperature can impact reef health."*
- *"About the destruction to coral reefs."*
- *"How fragile reefs are to temperature."*
- *"At how much damage is being done."*
- *"How pervasive the problem is."*
- *"At how coral reefs are killed."*
- *"About the reefs affect by humans."*

- *"At what causes the reef's destruction."*
- *"That there is so much damage worldwide."*
- *"At the depth of disease and destruction by global warming."*
- *"That so much damage was caused by silt."*
- *"How the reefs get damaged and what feeds on it."*
- *"Because I did not know it was such a problem."*
- *"By the risk divers take and how fast the reefs are dying."*
- *"At how true it was that reefs are in trouble."*
- *"That they are working to protect the reef."*

#### Marine Life / Environment (N=53)

- *"At the excellent film footage of the deep depths."*
- *"How many corals there are."*
- *"That there was corals so deep and living."*
- *"How much there is to know about the coral reefs."*
- *"Of how corals are formed."*
- *"Amount of life on the coral reef."*
- *"By just how wonderful reefs are."*
- *"At the beauty of the corals."*
- *"By the fact that some parts of the reef had never been explored."*
- *"To know that some reefs are so many feet deep."*
- *"By the deep water reef – interesting."*
- *"At the beauty of the reefs and the amount of living things that are in reefs."*
- *"Of all the different life forms below."*
- *"About fish that clean other fishes' mouths."*
- *"At how many different fish there are."*
- *"By some of the creatures I saw."*
- *"That there are so many fish."*
- *"To see so many fish."*
- *"About how many new fish there were."*
- *"That fish are special."*
- *"How the octopus gets it's food."*
- *"When they found the sharks."*
- *"When the lady let the sea creature clean her teeth – cool."*
- *"To see the shrimp clean divers teeth."*
- *"The lady let a sea creature crawl in her mouth."*
- *"Size of clams."*
- *"By the current carrying the divers."*
- *"At how the coral reefs actually look."*
- *"To see how extensive the reefs were."*
- *"About how vast and colorful the endless reefs are."*
- *"How huge the reefs are."*
- *"By the many types and shapes of coral."*
- *"By the beauty of coral reefs."*
- *"At the astonishing beauty."*
- *"At the excellent techniques and the beautiful pictures."*
- *"That I got so intrigued in the coral."*
- *"That I didn't know about coral."*
- *"How important corals are."*
- *"At the underwater diversity."*
- *"Reefs are over 300 feet deep."*
- *"To see a shrimp digging out a hole for a fish."*
- *"At the remarkable contrast in Fiji and the reefs."*
- *"That there were so many types of marine life."*
- *"That the woman put a fish in her mouth."*

- *"That the divers were swimming with the sharks"*
- *"That divers were swimming with sharks."*
- *"At the number of sharks."*
- *"When a whole bunch of sharks swam into the film."*
- *"Of the people swimming with the sharks."*
- *"At the herd of sharks."*
- *"To see such a large school of sharks."*
- *"To learn about the octopus 'tenting' to catch prey."*
- *"By the octopus."*

#### An Interesting / Enjoyable Film (N=22)

- *"That it was so enjoyable."*
- *"To see how interesting it was."*
- *"How interesting it was."*
- *"When it ended. I didn't realize that one hour had elapsed."*
- *"I marveled at the show."*
- *"Felt like I was in it."*
- *"Pleasantly, awesome experience."*
- *"Yes! Awesome, very interesting."*
- *"Awesome."*
- *"Everything was amazing."*
- *"Everything was beautiful."*
- *"Liked everything."*
- *"All of it."*
- *"I liked everything."*
- *"Of the interesting pictures taken."*
- *"By the quality of the visual effects."*
- *"Visually exciting."*
- *"The movie looked cool."*
- *"How wonderful it looked."*
- *"The scenery was so good."*
- *"How well put together it was."*
- *"That it was so well done."*

#### Films' Educational Value (N=18)

- *"To learn what I learned."*
- *"With all the great information provided."*
- *"That it was so informative."*
- *"That it had so many details."*
- *"That the film gave so much information about coral/marine life."*
- *"How much information was transmitted."*
- *"By information about specific reefs."*
- *"By how informative the film was not just interesting."*
- *"At how interesting it was – thankful it wasn't for kids."*
- *"By the amount that I learned from this movie."*
- *"That they showed viable solutions."*
- *"About the important information given."*
- *"To learn lots of things I haven't learned."*
- *"On how much there is to know about the ocean."*
- *"Because I did not know a lot."*
- *"I'm pleased with the information."*
- *"That the film showed so much in so little time."*
- *"At how much information you covered in a short time."*

### IMAX Capabilities (N=9)

- *"By the new screen and size."*
- *"The soft edge near the outside of the dome."*
- *"How 3-D the effect of the IMAX was."*
- *"That something that could be boring on TV is exceptional with IMAX."*
- *"At the great sound system and the film technology."*
- *"The size of the screen."*
- *"At how big it was."*
- *"By the visual experience."*
- *"At the intensity of viewing it was incredible."*

### Depth of Dives (N=3)

- *"They were able to dive to 350 feet."*
- *"At the 350 foot depth achieved in one dive."*
- *"How deep they were able to dive."*

### Film's Music Score (N=2)

- *"At the use of music."*
- *"At the great music."*
- *"By the music."*

### Social Commentary (N=2)

- *"At how flaming the bias of evolution global warming was promoted."*
- *"At the level of insipid arrogance of the NSF."*

### Miscellaneous (N=21)

- *"At the aerial photography, unexpected, beautiful and very positive."*
- *"How peaceful it made me feel."*
- *"At the quality."*
- *"Unique."*
- *"About the disease you can get."*
- *"At the amazing camera work."*
- *"At the number of cameras."*
- *"I've never seen under the sea level before."*
- *"When we were flying."*
- *"The colors were so vibrant."*
- *"It was not more specific."*
- *"That the movie was so long."*
- *"At the slow pace."*
- *"About the level of drama faked by Howard et al."*
- *"At how little IMAX stories/films have evolved."*
- *"When loud music came on."*
- *"That people work so hard on reefs."*
- *"Because I never knew people were so brave to undertake such adventures."*
- *"How deep they dived and how a dying reef looked."*
- *"When they said, Hey."*
- *"About the problem of sitting."*

**What Disappoints Film Viewers.** The post-viewing sample was asked to complete the sentence stem, "I was disappointed . . ." A total of 150 viewers provided a response to this inquiry. Responses were sorted into the categories that emerged from a review of their comments. For example, a total of 32 respondents (21.3%) simply wrote the word "nothing" to indicate there is nothing about the film that disappointed them. This is corroborated by the following 8 (5.3%) similarly positive comments:

- "Nothing, it was great."
- "Nothing, the film was great."
- "With nothing, it was wonderful."
- "In nothing. Enjoyed immensely."
- "No disappointment."
- "I wasn't."
- "Never was and never will be."
- "With nothing really."

A summary of the other 110 responses are summarized in Table 16. Viewers' actual remarks are included following the table. Note that 38.2% of the respondents to this inquiry were disappointed by the plight of coral reefs. An equal percentage of respondents (10.0%) were disappointed that solutions to coral reef plight were not shown and that the film was not longer. Another 9.1% were disappointed that there wasn't more information contained in the film.

Table 16. What Disappoints Film Viewers

Variable	Categories	Responses (N=110)
Liked Least	Plight of coral reefs	42 (38.2%)
	Solutions to reef plight not shown	11 (10.0%)
	Film is too short	11 (10.0%)
	Not enough information	10 (9.1%)
	Theater shortcomings	6 (5.5%)
	The story and narration	4 (3.6%)
	More types of fish not shown	3 (2.7%)
	Miscellaneous comments	23 (20.9%)

Respondents' actual comments describing what disappointed them are presented below to convey the full nature of their thoughts.

#### Plight of Coral Reefs (N=42)

- "That coral reefs are dying."
- "That coral reefs are dying."
- "About coral reefs dying."
- "About what is happening."
- "That this is happening."
- "That reefs are dying."
- "To know that some reefs are dying around the world."
- "To see the dead coral."
- "In how we as people are wrecking the reefs."
- "That our reefs may not be here in 30 years."
- "To learn that reefs could be gone in 30 years."
- "To learn how much of the reefs are dying."
- "That the coral reefs are dying."
- "That these corals may be things of the past."
- "That not more is being done to save them."
- "That not very many people have the right knowledge."
- "That loggers were so irresponsible."
- "In the logging in Fiji."
- "At how commercial fishing is not adequately regulated."
- "That we over fish in beautiful areas."
- "To see all the fish dying and the coral reef too."
- "To hear about reef death."
- "That there was this story to tell."
- "That the reef is dying."

- *"That the coral reef got so bad."*
- *"That it is dying."*
- *"That they are dying."*
- *"In all of them dying."*
- *"That the coral reefs are dying."*
- *"That the reefs were dying."*
- *"Because beautiful animals are dying."*
- *"To see how fast the coral reefs were dying."*
- *"By the fact that coral reefs may disappear in 30 years."*
- *"That these magnificent creatures could be gone in 30 years."*
- *"To find out that corals are dying at a fast rate."*
- *"To see that it can be gone (damaged) for the future."*
- *"That the earth is losing it's beautiful coral reef so fast."*
- *"That it's health is so fragile."*
- *"By the damage humans have caused."*
- *"That humans cause so much damage."*
- *"That this does not get more press i.e. Global Warming or Deforestation."*
- *"In the lack of examples of dying coral reefs."*

#### Solutions to Reef Plight Not Shown (N=11)

- *"To think that it is unlikely we can influence nature to the point of changing it. We can only affect it and slow down problems, but too many people regardless of good intentions a sad future."*
- *"That no solutions were presented or being implemented."*
- *"Pollution was not discussed on reef survival."*
- *"More info. wasn't given at the end on how to help. Make it brainless."*
- *"More immediate solutions."*
- *"How they didn't update us on how that one guy's reef was doing."*
- *"We aren't doing more."*
- *"They didn't show more about saving it."*
- *"That we haven't done more to stop it."*
- *"That not many people take care of them."*
- *"That there's not much we can do about it."*

#### Film Is Too Short (N=11)

- *"The show wasn't longer."*
- *"That it wasn't a longer film."*
- *"The film wasn't longer."*
- *"That it wasn't longer."*
- *"The film was too short."*
- *"How short it was."*
- *"That it didn't last longer. I want to buy the video!"*
- *"Because it was short."*
- *"That it was too short."*
- *"How short the movie was."*
- *"IMAX films are too short."*

#### Not Enough Information (N=10)

- *"By the lack of enough fish names."*
- *"At the level in which certain species were discussed. It seemed like too much info with little in depth conversation."*
- *"Need more explanation (teaching) of what coral is and how they are formed."*
- *"Lack of information."*
- *"That there was less information."*
- *"The little build-up there was to the problem presented."*
- *"That it wasn't clear how the hero would save the reef."*

- *"By the lack of depth."*
- *"It didn't get more scientific."*
- *"Ten months of diving and so little information."*

#### Theater Shortcomings (N=6)

- *"A tiny bit too loud."*
- *"Was a little loud."*
- *"The room was so cold."*
- *"In the curved screen."*
- *"That it wasn't larger."*
- *"A little about the quality of focus."*

#### The Story and Narration (N=4)

- *"By the 4<sup>th</sup> grade level story."*
- *"By the story line, only a little though."*
- *"In the writing."*
- *"That the film included the typical MacGallivary/Freeman tragedy."*

#### More Types of Fish Not Shown (N=3)

- *"That I didn't see more types of fish."*
- *"To not see more large fish."*
- *"At not seeing as many animals as I would liked."*

#### Miscellaneous (N=23)

- *"I hadn't brought all my friends and family."*
- *"About how much I did not know."*
- *"At the number of shots of people talking."*
- *"Because I did not enjoy this movie as much as the shark IMAX movie in the past fall."*
- *"At the amount of ordinary footage."*
- *"That there was not much action."*
- *"That it didn't seem like you were in it that much."*
- *"It was a little slow and drawn out."*
- *"By the music score."*
- *"That there were a few too many close ups for too long."*
- *"There wasn't more fish."*
- *"At the discussion of the hazards of diving."*
- *"About the marine biologists."*
- *"Not to see the Philippines."*
- *"That the camera malfunctioned."*
- *"In how hard it was to get the e-mail address for further reference."*
- *"We didn't see more of islands."*
- *"In the little fish Richard Pule found even though it was an undiscovered red species."*
- *"In the speed of some of the action."*
- *"Howard and Michelle have made much better movies."*
- *"That the film was a little boring."*
- *"By the music; sentimental and manipulative to use Crosby Stills & Nash Teach Your Children."*
- *"That the taxpayers were forced to pay for this tripe. How about equal time."*

**What Confuses Viewers.** When asked, none of the 402 members of the post-viewing sample reported anything about *Coral Reef Adventure* actually being confusing. However, 25 (6.2%) of the viewers did report a desire for additional clarifying information. The following broad range of remarks are direct quotations from these individuals:

- *"Explain or teach the audience what is a coral reef before diving into the real film."*
- *"What exactly a reef is and what is it's purpose."*

- “The synthesis back to why coral reefs are near shore and if they are unhealthy or not.”
- “Not enough evidence that coral reefs will be gone in 30 years.”
- “Why the warming of water is damaging to the ecosystem.”
- “Why the water is warming.”
- “Who is MacGillivray? Why did they only have 6 weeks left? Until what?”
- “Since it proves how global warming is so damaging, why does the U. S. government and it’s stupid president refuse to believe these facts.”
- “Why is the political agenda of global warming and joining on political organizations promoted?”
- “How exactly was Rusi going to save his reef. What are the bends – how are they prevented.”
- “How did Howard get the bends? What are the bends?”
- “What causes the bends.”
- “The people against the fishing had no case.”
- “How IMAX camera works.”
- “How to support their efforts. Would have preferred more information.”
- “Some of the scientific information about the ecosystem.”
- “Background on pollutants of the reef.”
- “What were the answers to restore the Fiji reef, none in the film.”
- “How to save the coral reef.”
- “How long for the mangrove trees to grow enough to actually filter enough silt to begin to facilitate the re-growth of environment.”
- “Where was the camera filming the guys doing the filming? And who was running it?”
- “Did the coral reef get better?”
- “Translation device would help those who don’t speak English, also, it might help to have descriptive narration device for visual or deaf person.”
- “No personally, but for younger kids a simpler explanation of coral reefs and related ecosystem input have been useful.”
- “It does seem that I remembered more than I thought (judging the reverse side of this survey), but I really didn’t catch some of the function of the organisms in the reef.”

**The Lobby Exhibit’s Impact.** As previously specified, at the time of this study the interactive coral reef exhibit, titled “Weird, Wild and Underwater,” was located adjacent to the IMAX theater’s entrance lobby in San Jose. In contrast, St. Paul did not have the exhibit. Both the pre- and post-viewing surveys include questions that probe for information about the following outcomes:

- How do film viewers rate the *Weird, Wild and Underwater* exhibit’s informative value?
- How visually interesting is the exhibit?
- How do exhibit users/ viewers rate the following four major components?
  1. Wheels to match plants/ animals with names;
  2. Three-dimensional display of replica corals;
  3. The list of five action items for reef conservation;
  4. Video monitor displaying underwater scenes.
- How do the learning outcomes of film viewers who interacted with exhibit compare with those who didn’t?

Both prior to and after seeing *Coral Reef Adventure*, different samples of randomly selected viewers were asked to rate how informative the lobby exhibit is. In spite of the exhibit’s prominent location, 82 (43.4%) of the 189 respondents to the pre-viewing survey in San Jose had interacted with the exhibit. Of the 197 post-viewing respondents in San Jose, a fewer 47 (23.9%) reportedly had interacted with the exhibit. Verbal remarks overheard by the researcher while post-viewing respondents completed the survey suggest that they had difficulty recalling whether

or not they had seen/interacted with the exhibit. For many film viewers, the exhibit was perceived to be a promotional display for the film, rather than an interactive exhibit containing learning activities.

Table 17 shows that, on average, pre-viewing respondents in San Jose gave the exhibit an overall 3.61 rating on a five-point scale ranging from 1 (Not Informative) to 5 (Very Informative). Post-viewing respondents generally rated the exhibit's informative value as 4.04. On average, the entire 128 member pre- and post-viewing sample of exhibit users gave it's level of information a 3.77 rating, with 28.9% of the respondents describing it as "very informative."

Table 17. Rating the Lobby Exhibit's Informative Value

Variable	Rating/Category	Pre-Viewing (N=82)	Post-Viewing (N=46)
Informative Value	5 (Very Informative)	17 (20.7%)	20 (43.5%)
	4	24 (29.3%)	10 (21.7%)
	3	37 (45.1%)	14 (30.4%)
	2	–	2 (4.4%)
	1 (Not Informative)	4 (4.9%)	–
<i>Average</i>		3.61	4.04

Viewers were also asked to rate how visually interesting the lobby exhibit is. Table 18 shows that, on average, pre-viewing respondents to this inquiry gave the exhibit a 3.65 rating on a five-point scale ranging from 1 (Visually Boring) to 5 (Visually Interesting). Post-viewing respondents generally rated the exhibit's visual interest as 4.15. On average, the entire pre- and post-viewing sample of exhibit users gave it a visual interest rating of 3.84, with 36.2% of the respondents describing it as "very interesting."

Table 18. Rating the Lobby Exhibit's Level of Visual Interest

Variable	Rating/Category	Pre-Viewing (N=81)	Post-Viewing (N=46)
Visual Interest	5 (Visually Interesting)	26 (32.1%)	20 (43.5%)
	4	21 (25.9%)	16 (34.8%)
	3	23 (28.4%)	7 (15.2%)
	2	2 (2.5%)	3 (6.5%)
	1 (Visually Boring)	9 (11.1%)	–
<i>Average</i>		3.65	4.15

Pre- and post-viewing survey respondents were asked to rate the interest level of the following four exhibit activities:

1. Wheels to match plants / animals with names;
2. Three-dimensional display of replica corals;
3. The list of five action items for reef conservation;
4. Video monitor displaying underwater scenes.

When asked to rate how interesting it is to use spinning wheels to match up images of strange-looking plants and animals with even stranger names, pre-viewing respondents gave this learning activity a 3.23 rating on a five-point scale ranging from 1 (Not Interesting) to 5 (Very Interesting). Post-viewing respondents generally rated the interest level of the wheel matching activity as 3.98 (See Table 19, on the following page.). On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 3.50, with 16.0% of the respondents describing it as "very interesting."

Table 19. Rating the Lobby Exhibit's Matching Wheels Activity

Variable	Rating/Category	Pre-Viewing (N=79)	Post-Viewing (N=46)
Matching Wheels	5 (Very Interesting)	8 (10.1%)	12 (26.1%)
	4	29 (36.7%)	22 (47.8%)
	3	19 (24.1%)	11 (23.9%)
	2	19 (24.1%)	1 (2.2%)
	1 (Not Interesting)	4 (5.0%)	–
<i>Average</i>		3.23	3.98

The researcher observed that young exhibit users displayed difficulty moving and matching plant and animal images on one wheel with the corresponding name on the other wheel. The spring loaded wheels are difficult for some children to move. Additionally, because the spring mechanism causes the wheels to “snap” into place when moved to a new position, several people’s fingers were observed to have been caught between the wheel and the display, resulting in a painful pinch. Each of them immediately walked away from the exhibit. The researcher promptly informed a MacGillivray Freeman representative about this observation.

It was also observed that if you first position an image of a plant or animal on the left wheel, you can then turn the right wheel until a name contained on it matches the selected image, causing a green light to glow rather than a red light. The reverse procedure, however, does not produce the same result. If you first position the right wheel to display a desired name, turning the left wheel to the matching image will result in the red light glowing rather than the green (correct) light. This appeared to frustrate some exhibit users. The only text that appears on the display with respect to the matching wheels activity is: “Can you match up the reef occupant with its name?”

When asked to rate how interesting it is to interact with the exhibit’s hands-on 3-D display of corals, pre-viewing respondents gave this interactive learning activity a 3.68 rating on a five-point scale (See Table 20). Post-viewing respondents generally rated the interest level of the 3-D display as 4.15. On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 3.86, with 28.6% of the respondents describing it as “very interesting.”

Table 20. Rating the Lobby Exhibit's 3-D Coral Display

Variable	Rating/Category	Pre-Viewing (N=79)	Post-Viewing (N=47)
3-D Display	5 (Very Interesting)	15 (19.0%)	21(44.7%)
	4	30 (38.0%)	16 (34.0%)
	3	30 (38.0%)	6 (12.8%)
	2	2 (2.5%)	4 (8.5%)
	1 (Not Interesting)	2 (2.5%)	–
<i>Average</i>		3.68	4.15

Asked to rate the interest level of reading the exhibit’s list of 5 action items for coral reef conservation, pre-viewing respondents gave this learning activity a 3.99 rating on a five-point scale (See Table 21, on the following page.). Post-viewing respondents generally rated the interest level of the list as 3.83. On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 3.93, with 31.8% of the respondents describing it as “very interesting.”

Table 21. Rating the Lobby Exhibit's List of Conservation Action Items

Variable	Rating/Category	Pre-Viewing (N=79)	Post-Viewing (N=47)
List of Action Items	5 (Very Interesting)	24 (30.4%)	16 (34.0%)
	4	34 (43.0%)	14 (29.8%)
	3	19 (24.1%)	12 (25.5%)
	2	–	3 (6.4%)
	1 (Not Interesting)	2 (2.5%)	2 (4.3%)
<i>Average</i>		3.99	3.83

Asked to rate the interest level of viewing the underwater scenes displayed on the exhibit’s video monitor, pre-viewing respondents gave this activity a 3.99 rating on a five-point scale. Post-viewing respondents generally rated the interest level of the video monitor as 4.04. On average, the entire pre- and post-viewing sample of exhibit users gave this activity a rating of 4.01, with 44.5% of the respondents describing it as “very interesting.”

Table 22. Rating the Lobby Exhibit’s Four Activities

Variable	Rating/Category	Pre-Viewing (N=82)	Post-Viewing (N=46)
Video Monitor	5 (Very Interesting)	39 (47.6%)	18 (39.1%)
	4	12 (14.6%)	14 (30.4%)
	3	24 (29.3%)	12 (26.1%)
	2	5 (6.1%)	2 (4.4%)
	1 (Not Interesting)	2 (2.4%)	–
<i>Average</i>		3.99	4.04

As previously specified, to gain insight into the impact that the interactive coral reef lobby exhibit has on viewers of *Coral Reef Adventure*, a comparison of learning outcomes was performed between film viewers in San Jose who interacted with the exhibit and film viewers who did not interact with the exhibit. There is not a significant difference between the mean achievement scores across samples (i.e., exhibit users vs. non-exhibit users), as tested by a 2-way ANOVA, F-ratio (3,382) = 3.3865,  $p = 0.0665$ . Thus, learning outcomes resulting from interaction with the lobby exhibit are not statistically significant.

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