

American Geological Institute Earth Science Week 2004 Evaluation Report

INTRODUCTION

Earth Science Week began in 1998 as the American Geological Institute's (AGI) first national outreach program. For this outreach effort AGI provided ideas and activities for schools (K - 12) and universities, as well as state and private organizations involved in doing something in the earth sciences during one week in October. For Earth Science Week (ESW) materials are disseminated in print as well as via the web. In particular AGI developed a free "ESW Kit" of materials such as posters with activities on the back, activity booklets, planning guides as well as actual lessons. Initially these kits were distributed for free to any one who requested them. After 15,000 kits were distributed, they are now mailed out for \$4.95 to cover postage and handling. Since the start of ESW in 1998, AGI has served as the distribution center while outside organizations (e.g., schools, museums, state geological surveys) have actually implemented the distributed materials.

The purpose of this report is to gather data on national activity for Earth Science Week 2004 participants. This data forms a baseline for making and examining changes and thereby developing and implementing new strategies and ideas for future programs. Earth science affects all members of society in some manner. Using observations and measurements from instruments in space, under water, and on the ground, geoscientists constantly evaluate the Earth's present state, make predictions about how it will change in the future, and assess the effects of Earth's changes on life and society. As such, an understanding of the relevance of earth sciences is extremely important. In this regard, the overall mission of ESW is to focus on different facets of earth science to help all people gain a better understanding and appreciation of the natural world. In 2002, the theme was "*Water is All Around You*", emphasizing the importance of the earth's greatest natural resource. In 2003, the theme was "*Eyes on Planet Earth*", which focused on the important work performed every day by geoscientists throughout the world. In 2004 (the subject of this report), the theme was "*Living on a Restless Earth*". The four objectives for ESW 2004 were:

- To engage students in discovering the Earth sciences.
- To remind people that Earth science is all around us.
- To encourage Earth stewardship through understanding.
- To motivate geoscientists to share their knowledge and enthusiasm about the Earth.

This theme was selected because the dynamic processes of our planet affect the global community every day.

METHODOLOGY

Data for this evaluation was generated from a web survey. That is, PS International designed and implemented a web-based survey that was posted on its website. Approximately 1400 past ESW participants in the AGI database were contacted via email by PS International and asked to respond to this posted survey at the PS International website.

The survey dealt with use of materials, media coverage, suggestions for specific activities and improving ESW in general, and a question about future participation. The PS International survey also included an overall rating question on a four point scale about the usefulness of ESW.

RESULTS

The quantitative findings of the PS International web survey are examined. There were 158 valid responses to the survey yielding a response rate of 11% against the original mailing list of 1400 names. If incorrect email addresses (e.g., "undeliverables") from the list are eliminated the estimated actual response rate goes up to 13%. Thirty seven percent (up from 35% in 2003 and up from 27% in 2002) of the respondents were teachers, almost 10 percent were administrators (up from 7% in 2003). The remaining 53% of the respondents checked other. Among these, 48%, close to half were from the geological related professions (down from 59% in 2003) and another 34% were in education-related fields (i.e., teacher trainers, professors, museum curators - up from 31% in 2003). About 6% of "other" were students (down from 14% in 2003), and the remaining 11% (up from 6% in 2003) were from the corporate sector.

Figure 1 below shows the *yes/no* distribution for participation rates in 2001, 2002, 2003 and 2004 as well as projected rates for 2003 (in 2002), for 2004 (in 2003) and for 2005 (in 2004). This is further broken down in Figure 2 for Teachers, Administrators and Other.

Figure 1
Participate in ESW?

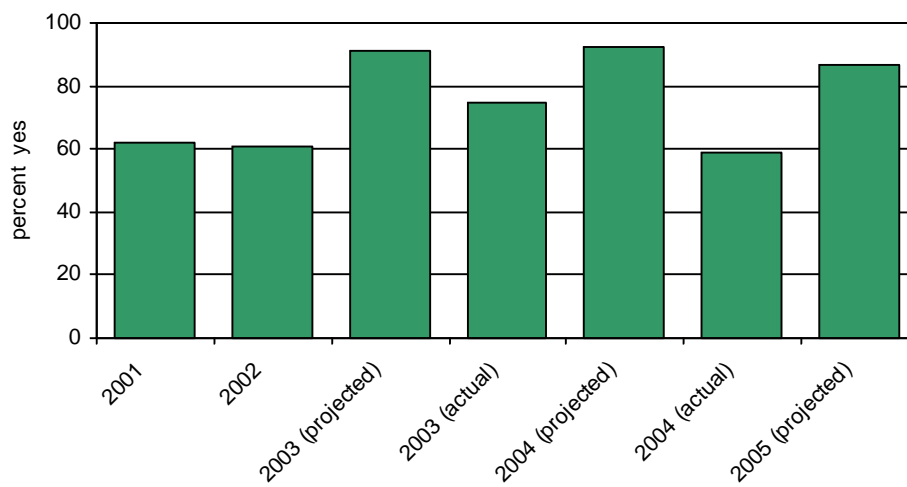
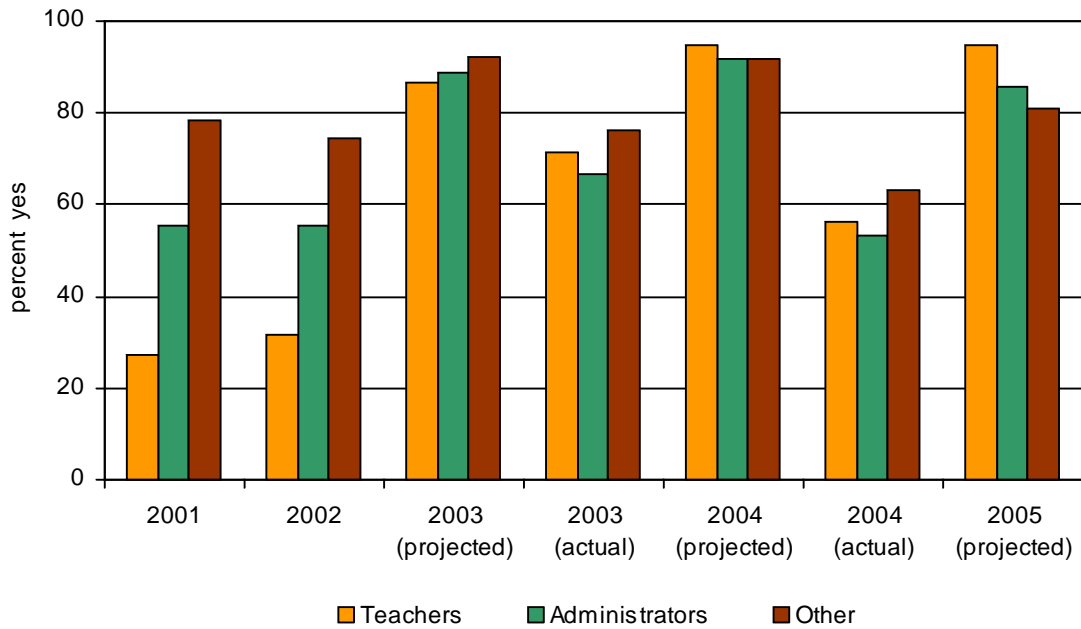


Figure 2
Participate in ESW?



For 2004, while the relative position of the three groups remains the same as 2003, overall the participation rates have declined slightly from 2003. While the teacher participation rate for 2004 is higher than earlier years (i.e., 2001 and 2002), there is a slight decline for administrators and a larger decline for "Other" (which is mostly professional geologists) relative to 2001 and 2002. It is interesting to note that the 2005 projected participation rates rise to comparable levels of the previous year projection for teachers but falls off slightly for administrators and even more so for "Other" (largely professional geologists). It appears from this data that the group experiencing the biggest actual decline and projected decline would be the "Other" category (i.e., largely professional geologists). Figure 3 below groups the data by responding category (i.e., teacher; administrator; other) in order to highlight the pattern differences over the three years from one group to the next.

Figure 3
Participate in ESW?

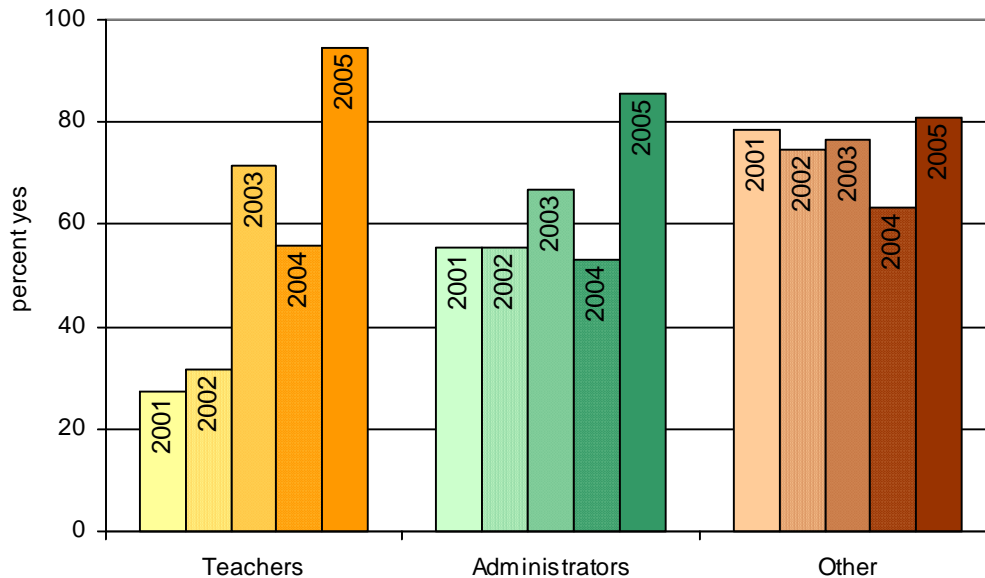


Figure 3 clearly shows the consistency of the “Other” category (i.e., professional geologists) in contrast to the clear dramatic increase among teachers from 2002 to 2003. However Figure 3 also shows the dip in the 2004 participation rate for all three groups, including and especially “Other”.

Overall 76% of the respondents regardless of category rated the usefulness of ESW as *excellent or good* (substantially up from 2002 and slightly up from the 74% in 2003). This index improved again in 2004 with only 19% rating ESW as *fair* compared to 21% in 2003 and 27% in 2002. If those that did not participate are not included in the percentage calculation then *excellent and good* gets 82% of the respondents (up from 76% in 2003), and *fair or poor* gets only 18% of the respondents (compared to 24% in 2003 and 55% saying *fair or poor* in 2002). Also, on a four-point scale, the average overall usefulness rating is 3.0, which is unchanged from 2003 but up substantially from 2.47 in 2002. Thus, the overall rating of the usefulness of ESW which went from halfway between *fair and good*, to *good* from 2002 to 2003, and stayed level at *good* in 2004. The means for each of the three role categories are: “Teachers” at 3.2 (no change from 2003 and up from 2.38 in 2002), “Administrators” at 3.1 (down from 3.3 in 2003 and up from 2.57 in 2002) and “Other” at 2.8 (up from 2.74 in 2003 and up from 2.48 in 2002). Figure 4 (a, b, c) below provides a percentage breakdown for each of these three categories of respondents for 2002, 2003 and 2004. The strong improvement from 2002 to both 2003 and 2004 can be seen by comparing Figures 4a, 4b and 4c, particularly those responding in the “*poor*” category and the “*good*” category

As can be seen in Figure 4 (a) (b) and (c) above, “Administrators” rated the usefulness of 2003 ESW the most often as *excellent or good*. However in 2004 “Administrators” primarily rated ESW as *good*, less so *excellent* and none rated it as *poor or fair*. Furthermore whereas in

2002 “Teachers” were definitely equally divided in their opinion between “*excellent*” and “*poor*”, that opinion division is not present in 2003 and 2004: teachers are most often rating the usefulness of ESW as either “*good*” or “*excellent*”. The largest category of respondents “Other” (mostly professional geologists) tended to rate ESW as “*good*”, up from “*fair*” in 2002. In 2004, as in 2003, the opinion about the usefulness of ESW was much more positive and less divided than it was in 2002.

Figure 4a

Figure 4b

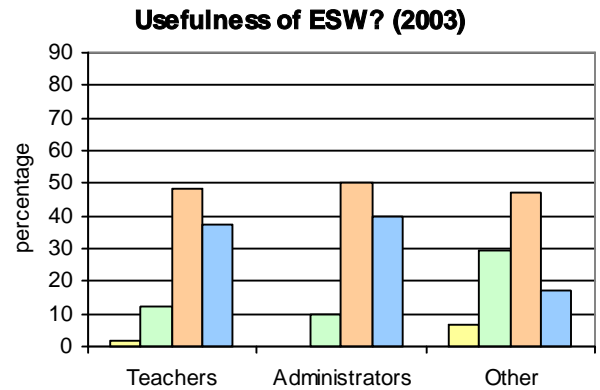
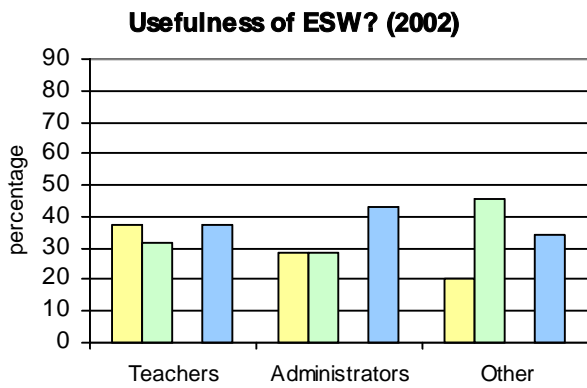
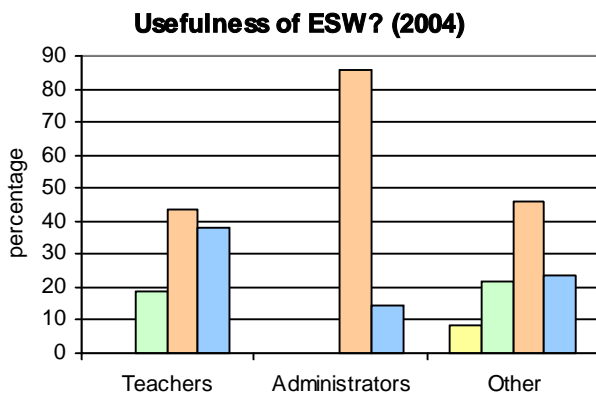
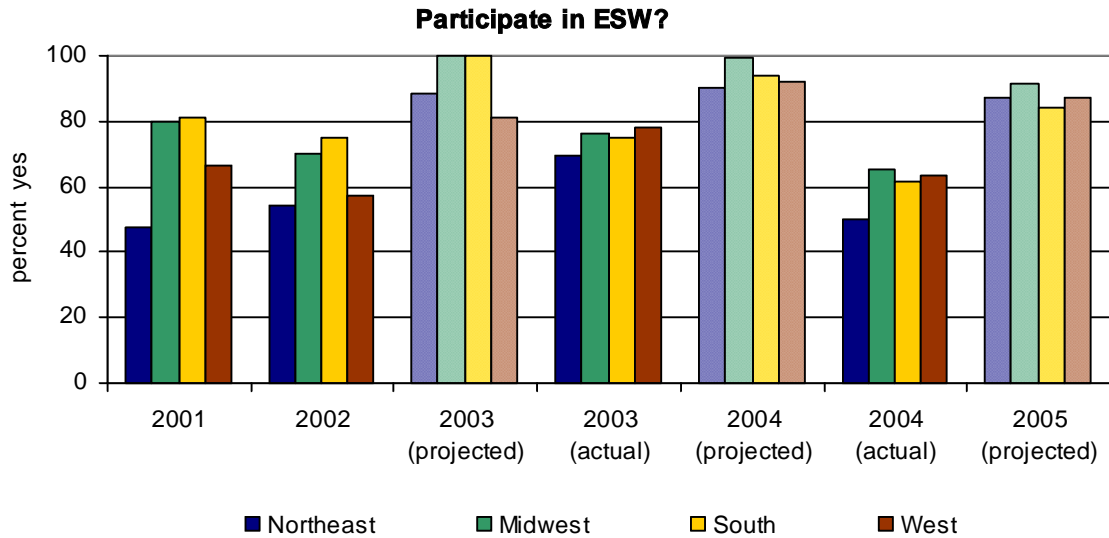


Figure 4c



The regional results are equally interesting. Figure 5 below shows the *percent yes* distribution for participation rates in 2001, 2002, 2003 (projected), 2003 (actual), 2004 (projected), 2004 (actual) and 2005 (projected) for the Northeast, Midwest, South and West.

Figure 5



There appears to be a "dip" in interest in 2004 relative to 2003, with the Northeast dropping below 2002 levels. The other three regions, although lower than 2003, show consistently higher participation rates, in contrast to the Northeast. Nonetheless the regional participation rates are all down from 2003 levels. In both the actual and projected participation rates the Midwest stays slightly above the other three regions. Figure 6 (a, b, c) below plots the "usefulness" rating categories for each of the four regions for 2002, 2003 and 2004.

Figure 6a

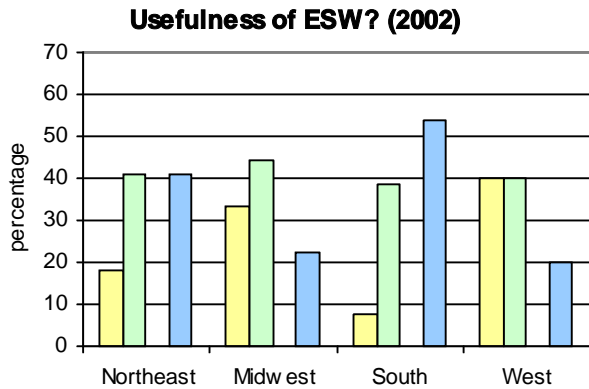


Figure 6b

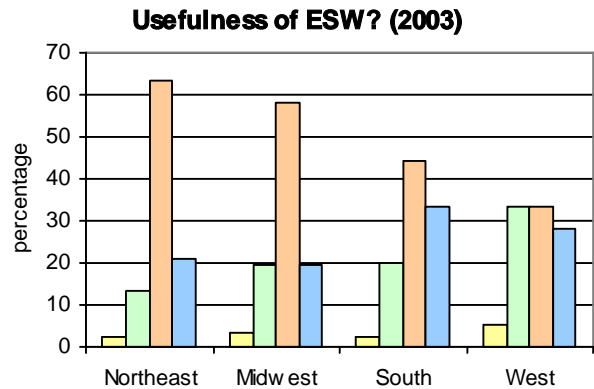
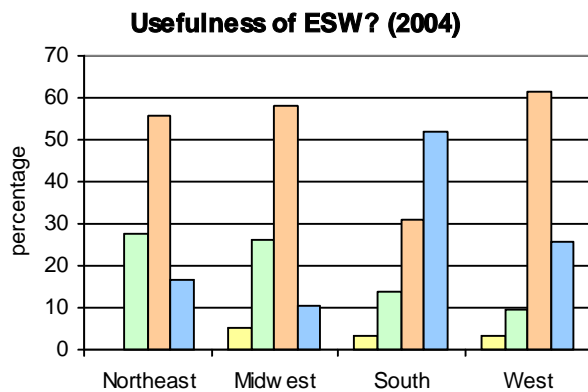


Figure 6c

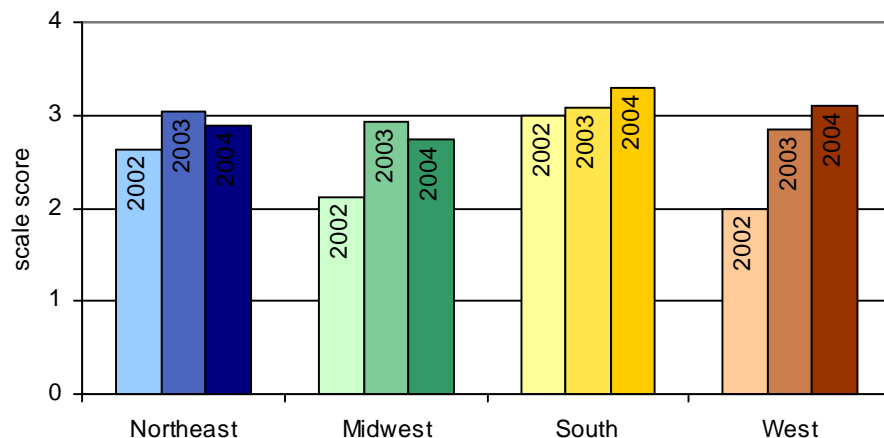


- Poor
- Fair
- Good
- Excellent

Contrasting Figure 6a with 6b and 6c, it is clear that 2003 and 2004 were stronger years than 2002. As in 2002, the South in 2004 gave ESW the strongest usefulness ratings. Also from 2003 to 2004 it appears that the Northeast region considerably diminished in their usefulness ratings. Figure 7 below plots the average usefulness rating on a 4-point scale for each region. It can be seen in Figure 7 that for 2004 the average ratings rose in the South and West and diminished in the Northeast and Midwest. Thus it appears that the 2004 "dip" in ratings mentioned earlier may be attributed to the falling ratings in the Northeast and Midwest.

Figure 7

Average Usefulness by Region for 2002, 2003 and 2004



Next the qualitative narrative data associated with web questions one, four, five and six are examined. These questions are:

1. *How did you first learn about ESW?*
4. *How did you and/or your colleagues participate in 2003 ESW? That is:*
 - a. *List activities (e.g., posters lesson plans, etc) that were used.*
 - b. *List locations of activities (e.g., school, local club, etc)*
 - c. *About how many participants per activity?*
 - d. *Were you more or less active this year (2003) than last year?*
5. *In your opinion was the adequacy of media coverage of ESW. Please be as specific as you can (e.g., newspaper, TV, radio).*
6. *How can AGI improve upon or increase the impact of ESW? (Please include in your response suggestions for additional ESW activities)*

The two primary ways that participants learned about ESW was through the Internet/email (28%; up from 17% in 2003) and through written mailings such as newsletters (25%; no change from 2003).

"While scanning the WWW."

"Electronic newsletter in email."

"Email announcement from USGS."

"Online by chance."

"I saw a brief write-up in a science teacher's magazine, Science Scope or Science and Children."

"Newsletter: I think it was Andrew Alden's."

Another 22 % of the respondents heard of ESW directly from AGI, with 14% hearing about it through a professional meeting, and 10% (vs 23% in 2003) heard about ESW from a colleague. Table 1 below summarizes these findings.

Table 1
How Did You First Learn About ESW?

Colleague	Newsletter, mailing, bulletin	Professional meeting	Internet website or via an email	AGI
10% (23% in 2003)	25% (25% in 2003)	14% (20% in 2003)	28% (17% in 2003)	22% (15% in 2003)

There were a variety of ways that respondents indicated that they participated in ESW 2003. Participation ranged from less active events such as state proclamations by local or state officials (e.g., a state governor), poster displays, sticker distributions, emails and websites to very active events such as field trips, workshops and tours. The pattern of findings is similar to 2003 and 2002 ESWs, with one exception. For 2004 there was a 6% increase in field trips and workshops with a balancing decrease in contests and essays. Table 2 below summarizes these findings.

Table 2
Ways of Participating in ESW

<u>Least Active</u> Proclamations; poster displays; stickers; websites	Talks	Demos; Open House; Expos	Quiz Shows; Contests; Essays	<u>Most Active</u> Field trips; tours; workshops
43% (41% in 2003; 44% in 2002)	7% (9% in 2003; 14% in 2002)	24% (23% in 2003; 14% in 2002)	4% (11% in 2003; 7% in 2002)	22% (16% in 2003; 21% in 2002)

Although field trips were often mentioned (i.e., 22% [up from 16% in 2003]), the least active ways were the most common ways of participating in ESW (i.e., 43%). In 2002, 72 respondents gave total number of participants in ESW as 15,120 (or ~210 participants per respondent). In 2003, 96 respondents gave the total number of participants in ESW as 36,440 (or ~380 participants per respondent). In 2004, 69 respondents gave the total number of participants in ESW as 20,046 (or ~290 participants per respondent). In this regard the participation rate in 2004 is down from 2003 but still higher than 2002. Also, in 2004 more than half (i.e., 51%) of the respondents indicated that they were more active in ESW compared to 61% in 2003 and only 40% for 2002. Table 3 summarizes this finding.

Table 3
ESW Participation Data

Less Active in ESW	About the Same	More Active in ESW	2002: Estimated number of ESW participants per survey respondent	2003: Estimated number of ESW participants per survey respondent	2004: Estimated number of ESW participants per survey respondent
22% (9% in 2003; 30% in 2002)	27% (30% in 2003; 30% in 2002)	51% (61% in 2003; 40% in 2002)	~210 participants per respondent	~380 participants per respondent	~290 participants per respondent

The locations for ESW 2003 activities was most often museums, science centers and community locations (46%; up from ~21% in 2003). Schools were the next most frequently mentioned locations (~33%; down from 52% in 2003). Middle schools were mentioned as often as high schools, with elementary schools being mentioned slightly more often. This is in contrast to 2002 when elementary schools were not mentioned. Some example places that were mentioned are:

"Discovery Center in Santa Ana, CA, various schools and Caltech."

"Santa Barbara Museum of Natural History."

"Grant Middle School, Albuquerque, NM."

"Northern Territory, Western Australia."

"Petrified Forest National Park."

"At the Facultad de Ciencias Exactas y Naturales Pavillion in the campus of the University of Buenos Aires."

Eleven percent (vs 16% in 2003) mentioned universities as locations for ESW.

Question five on the PS International survey dealt with media coverage. As in 2002 and 2003, overall media coverage for ESW in 2004 was very low. That is, about 35% (relative to 50% in 2003) of the respondents rated it as nonexistent, and another 47% (relative to 24% in 2003) rated it as marginal. Thus overall for 2004 media coverage that was either "none" or "marginal" was 82%, compared to 74% in 2003. As some of the respondents mentioned, it may be that this lower media coverage in 2004 could be attributed to the 2004 presidential election media coverage.

"Very little [media coverage] ... it was an election year!"

"In our case, although this is the 5th annual ESW fair, TV and news media have declined to cover the event."

"In Canada, this initiative received little if any press coverage but I still would like to think that more can be done in the future."

"I was disappointed by the absence of any media coverage, especially with Mt. St. Helens and other geologic activities this fall."

For respondents that cited good media coverage, that coverage was associated with three things: 1) media through professional associations (rather than local public media like TV, radio and newspaper); 2) emails; 3) Internet.

"I did not see any coverage other than emails I received from AGI."

"There was not much coverage except on email."

"I never heard a thing about it [ESW] except while scanning the WWW."

"I only received emails, so no media coverage."

It is interesting to note that for many of the respondents "email" is considered to be different from "media", even though the broad definition of media is "a means of effecting or conveying something". A few respondents mentioned local coverage, and many respondents referred to coverage through professional channels which would include emails.

"Only one Earth Science item appeared in syndicated "Kids Corner" of local newspaper. The half-page mentioned ESW and had short accounts of floods, hurricanes, etc."

"In my opinion the media coverage was dismal. It was advertised in the HGS Bulletin, Museum member newsletter, and a few association websites. This gave us good coverage in the geoscience community, but the public had no idea it was taking place."

This last remark emphasizes the point that ESW media coverage was more than adequate in the professional community via bulletins, AGI website, and emails but very poor in the public sector.

The final written question asked for suggestions to improve the impact of ESW, including ideas for additional ESW activities. While there were a few suggestions for new activities (e.g., something on oceanography), most of the suggestions dealt with increasing the publicity about ESW. Table 4 below provides a summary of the three most frequent responses.

Table 4

Increase Publicity	Start Earlier	Free resources and incentives
47% (48% in 2003; 40% in 2002)	17% (21% in 2003; 18% in 2002)	19% ("Partnerships" was #3 in 2003 at 14%; dropped to 11% in 2004)

In 2004, as in 2003, the main suggestion from survey respondents about improving the impact of ESW was getting the word out about a good program (47%), and getting the word out earlier (17%). One respondent lamented that there was no follow-up after initial contacts. Several others suggested using "star power" to improve ESW publicity.

"AGI sends out a bunch of good stuff, but there seems to be no follow-up or push to get people involved. Telling people about ESW and then asking them 'What are you going to do?' is not an effective incentive for volunteerism. AGI needs to take a strong, proactive, unified, nation-wide approach to make this something big."

"Recruit a high visibility "spokesperson" (e.g., Dr. Sally Ride)."

"More international promotion of ESW. Get astronaut Neil Armstrong to tour around major participating countries during the week. The promotion in each country would be fantastic and then we'd have a unified global feel."

Several other respondents suggested that ESW develop an international component.

For 2004 the emergent suggestion for improvement dealt with getting free resources (e.g., ESW Kits) and similar incentives (e.g., posters).

"I really liked the children being able to earn a patch. It would be nice if they had similar programs with something [i.e., incentive] more specific through the year. Something they could earn learning about volcanoes, earthquakes, etc."

"Make available more distributable materials that are cheap for teachers to reproduce ... for example, one-page fact sheets on earth resources, earthquakes, etc ... at the bottom of each, note key websites that they and their students can access for more info, down-loadable exercises, etc."

"AGI donated some bookmarks and that was greatly appreciated."

A number of the suggestions for improvement (~11%, down from 14% in 2003) called for the establishment of more partnerships. Partnerships would provide more resources for ESW, and thereby improve the possibility of more and earlier publicity.

"Use the oil companies to assist in getting the word out."

"Get more educational institutions to participate directly."

A few respondents suggested that ESW engage in fund raising.

"As I have suggested several times, and will suggest again, ESW is viewed only as a geology topic, especially since it is sponsored by AGI. If we are truly to have an "Earth Science" week, then why isn't this a joint project including all the Earth Sciences? Land, Air, Water, and Space should include perhaps the American Meteorological Society, National Oceanic and Atmospheric Administration and NASA. I'd be happy to help coordinate this joint effort [ID #156; OH]. Also a joint group would possibly have more funds to work with. Should we look for an NSF grant to start this project?"

Finally a couple of respondents suggested setting a volunteer corps to give talks in schools and distribute ESW materials.

SUMMARY

Earth Science Week began in 1998 as the American Geological Institute's (AGI) first national outreach program. For this outreach effort AGI provided ideas and activities for schools (K - 12), universities, as well as state and private organizations involved in doing something in the earth sciences during one week in October. For Earth Science Week (ESW) materials are disseminated in print as well as via the web. In particular AGI developed a free "ESW Kit" of materials such as posters with activities on the back, activity booklets, planning guides as well as actual lessons. Initially these kits were distributed for free to any one who requested them. After 15,000 kits were distributed, they are now mailed out for \$4.95 to cover postage and handling. Since the start of ESW in 1998, AGI has served as the distribution center while outside organizations (e.g., schools, museums, state geological surveys) have actually implemented the distributed materials.

ESW 2004 saw reported participation rates fall from 2003 levels. In particular these rates fell to a greater extent for the "Other" category, which is largely professional geologists (Figures 2 and 3). The largest drop in regional participation rates was for the Northeast although the other 3 regions also fell somewhat (Figure 5). The Midwest appeared to show slightly higher participation rates than the other three regions. Table 3 shows that more respondents were *less active* in ESW 2004 (22%) relative to 2003 (only 9%), and in 2004 those that were *more active* dropped ten percentage points relative to 2003 to 51%. However, Table 2 shows that the activities for ESW 2004 were of a more active nature (e.g., field trips, workshops).

The perceived usefulness ratings remained strong relative to 2003 levels. Specifically, 76% of the respondents in 2004 rated ESW as *excellent* or *good*, a substantial improvement from 2002, and a very slight improvement from 2003. However, it should be noted that while the overall level of usefulness for 2004 was comparable to 2003, it appears that the number of *excellent* ratings fell, particularly for administrators (Figures 4b and 4c). Regionally the usefulness ratings for the Northeast dropped the most relative to the other three regions. The rating distributions improved from 2003 to 2004 for both the South and the West (see Figures 6b and 6c).

In 2004 media coverage for ESW was problematic. While there were posters, emails and websites, TV and radio coverage dropped off, possibly due to the national election. In 2004 about 82% of the respondents said that media coverage was either nonexistent or marginal.

Naturally the largest category for improvement was to *increase publicity* (47%). In this category a couple of respondents suggested recruiting "star power" like Dr. Sally Ride to attract groups to ESW. Many respondents wrote that they wanted to see more free resources and incentives (19%) such as "patches", or kits. There were several suggestions for developing fund raising activities on behalf of ESW.

RECOMMENDATIONS

- Expand email communications in a manner that would draw individuals, groups and institutions to ESW
- Expand the web presence of ESW (e.g., adding contests, activities, data collection work to current web offerings)
- Develop and implement links between the professional community and the education community via cross-over newsletters, speakers, workshops and shared websites
- Establish regional ESW leaders with specific participation targets and goals, and media/communication resources to follow-up on contacts
- Develop additional funding sources via grants and private sector partnerships that would support more extensive ESW publicity, particularly in the public sector such as schools, Boys and Girls Clubs, Boy Scouts, Girl Scouts, 4-H, county fairs
- Implement a more extensive materials incentive program which would include kits, patches, contests, project fairs, international data collecting, interconnecting virtual labs
- Develop strategies to attract TV and radio attention, with special attention to current geological events (e.g., Mt. St. Helens) and ways to link such events to ESW
- Seek to establish a national network of ESW volunteers to train, distribute and implement materials and events associated with ESW such as media packets, activities, and workshops
- Set participation goals for regional leaders and network of volunteers
- Begin ESW planning activities at least three months earlier than in 2004