

## Building an Effective Social Media Strategy for Science Programs

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Social media has emerged as a popular mode of communication, with more than 73% of the teenage and adult population in the United States using it on a regular basis [Lenhart *et al.*, 2010]. Young people in particular (ages 12–29) are deeply involved in the rapidly evolving social media environment and have an expectation of communication through these media. This engagement creates a valuable opportunity for scientific organizations and programs to use the wide reach, functionality, and informal environment of social media to create brand recognition, establish trust with users, and disseminate scientific information.

The EarthScope program (<http://www.earthscope.org>) seeks to better illuminate the structure and evolution of the North American continent using a variety of seismic, geodetic, and remote sensing instrumentation. Scientific discovery as a result of EarthScope is helping the public and scientific community better understand earthquake safety and fault dynamics, volcanic activity, global seismicity, and broader issues involving plate tectonics and Earth's interior. EarthScope's program goals for education and public outreach (see *EarthScope Education and Outreach Committee* [2007] and Hall-Wallace *et al.* [2002] for specific objectives) include a major focus on informal or free-choice geoscience education, and project leaders have made significant use of social media platforms in addressing these goals.

Now, after a few years of practice using social media, a few lessons and tips are readily apparent. These provide a firm foundation in the informal communication strategies helpful in reaching a diverse audience.

### *EarthScope's Social Media Goals*

The social media vision and content strategy for EarthScope is to offer high-quality

science content in a range of formats to appeal to various age groups. Broad goals are to increase public awareness of EarthScope science, to communicate timely scientific information, to engage with the public, to provide an informal venue for scientific discussion, and to increase brand recognition.

Uniting these threads is the idea that EarthScope's social media should prioritize the dissemination of new science, discoveries, and news involving EarthScope. Other content-posting priorities include new products or information from partner organizations, science- or hazard-related news, and relevant educational items.

### *EarthScope's Social Media Platforms*

Communication officers at EarthScope started building their social media program by first recognizing that Internet users of different ages prefer to interact with different kinds of social media [Lenhart *et al.*, 2010]. To help reach these different age groups, EarthScope's approach has been to ensure a strong presence in a diversity of social media platforms.

In 2011–2012 the EarthScope National Office (ESNO) at Arizona State University created an EarthScope presence on six different social media platforms: Facebook, Twitter, YouTube, Google+, LinkedIn, and Pinterest. Facebook and Google+ are social networking sites, Twitter is a microblog, YouTube and Pinterest are content communities, and LinkedIn is a professional networking site. The EarthScope Web site and electronic mailing list do not count as social media—these are considered “technologies” [Kaplan and Haenlein, 2010].

Continued activity on the microblog and social networking sites is particularly crucial and, although the number of daily posts on each site varies, posting between two and five times per day seems to give users the right amount of content without overwhelming the user feed. Although some information is duplicated across sites, most content is posted on only one platform. Trial and error has shown that for EarthScope's online communities, journal articles and educational

resources are well received on Twitter, whereas news stories and meeting and conference updates are better received on Facebook. These findings are likely unique to EarthScope's particular user communities.

### *Tracking Usage: How Many Hits?*

Many factors make social media attractive to both users and educators. The systems can be used for timely communication of important information. They are eminently scalable and can serve any number of users with little cost and no performance problems. They are searchable, user-friendly, and easy to access. They can be used to interactively engage about new scientific discoveries and continue the cycle of discussions, experiments, analysis, and conclusions that typify science. Finally, they have rich monitoring capability, enabling organizations to track usage, recognize trends, and modify strategies to adapt to the evolving social media landscape.

Tracking statistics are particularly valuable—they provide an estimate of the amount of exposure social media platforms provide. On Facebook, for example, EarthScope currently has around 1650 “likes,” meaning that around 1650 users subscribe to EarthScope's Facebook news feed. However, EarthScope's weekly reach—the number of people who potentially see project news and updates on the Facebook page—averages around 10,000 unique users per week.

The reach changes depending on how many followers “like” or “share” the content with their followers. With that included, EarthScope's highest weekly reach has exceeded 590,000 users. Thus, the more interesting and engaging the content disseminated, the more followers share it and the more exposure the organization receives.

On Twitter, the EarthScope account has almost 1000 followers, tweets approximately 70 times per month, and is retweeted by other users several times a day. The LinkedIn group has 140 members primarily composed of EarthScope researchers and graduate and undergraduate students, and EarthScope's other social media platforms also have small (but growing) online communities.

### *Engaging the Public*

Although EarthScope operates an active face-to-face education and outreach program,

ESNO has found that social media plays an important role in informal education, particularly in increasing brand recognition. At the 2012 AGU Fall Meeting, for example, many people who visited the EarthScope booth commented that they were aware of the program because of its Facebook page.

While visibility among scientists is important, another primary objective is to engage the public. To meet that goal, EarthScope has implemented other content posting strategies to draw users from outside the scientific community. On Facebook, one of the most successful attempts at community-building has been “Friday Funnies”—science-related jokes and cartoons that highlight the fun side of science. While Friday Funnies may be seen by some as irreverent, this strategy has significantly grown EarthScope’s user community. One user commented, “The funny posts caught my attention. Now I find many of the scientific posts really cool and informative.”

EarthScope’s Facebook and Twitter accounts receive daily feedback from scientists and the public, allowing social media coordinators the opportunity to see in real time what works and what doesn’t. For example, a recent posting about common science misconceptions received considerable feedback on Facebook and so was also posted on Twitter, where it sparked a lively discussion. The user community also initiates contact through social media by sharing news stories or personal experiences. For example, a user recently posted, “There is [an instrument] near my home and at first I didn’t know what it was, but a little investigating brought me here. Fascinating!” Users also frequently ask questions like “EarthScope, what do you think about all this fracking?”

#### *EarthScope Social Media Survey*

To gauge the effectiveness of EarthScope’s social media strategy in meeting its objectives, EarthScope staff reached out to the community via social media, e-mail, and the electronic mailing list and asked that they complete a short survey describing their interactions with EarthScope’s social media. Fifty-four people responded to the 11-question survey.

Users interacted most frequently with Facebook (82%), Twitter (32%), and YouTube (30%). When asked why they interact with EarthScope’s social media, users overwhelmingly reported that it was because of an interest in geology, seismology, or hazards (72%) or a general interest in science (50%). More than half (65%) expressed a particular interest in EarthScope research. When asked

about content, users responded that geology and hazard posts and general science content were most preferred, followed by EarthScope-specific posts and funny or entertaining content.

When given the opportunity to directly comment on EarthScope’s content and posting strategy, users were mainly positive, saying, for example, “I think you do well in leveraging humor, science, and your specific mission.” There were also useful content posting suggestions specific to different platforms such as “fewer retweets on Twitter.” There was some negative feedback, mainly from people who responded that they had never used social media and did not believe that it could be an effective outreach tool or believed it was “undignified.”

Nonetheless, the large degree of positive feedback suggests that EarthScope’s social media outlets adequately fulfill the needs of EarthScope’s user community and meet broader outreach and education goals.

#### *A Social Media Blueprint for Promoting Science*

Based on staff experiences creating a vibrant social media presence for EarthScope, here is a blueprint for other science organizations interested in social media.

First, establish clear objectives and posting strategies to ensure that a cohesive and comprehensive message consistent with the objectives of the organization is being presented.

Next, strategically select appropriate social media outlets, because certain platforms are likely to prove better suited for meeting specific objectives. Although Facebook, Twitter, and YouTube are the most popular and well-established sites with large potential audiences, smaller platforms may better target particular groups of people or better serve specific organizational goals. For example, LinkedIn users are connected and interact in a professionally oriented, although somewhat informal, environment. Pinterest users “pin” (highlight) visual content, enabling innovative distribution of visualizations.

Given that social media platforms are free to use, the primary expense incurred by a social media initiative is employee time, but once a workable routine is established, the time needed to feed the sites is minimal. Nonetheless, social media sites must be fed regularly to effectively build a community of users.

Finally, periodic evaluation of methods and strategies is imperative for meeting the needs of an ever-evolving online community. New platforms are constantly popping up, like

Tumblr, Sgroups, and Medium, so being tapped into the full range of informal information streams out there will lead to a path toward attracting the largest audience possible.

#### *Bringing Science Into the Mainstream*

Social media gives the public a chance to interact with scientists in real time in an informal and nonthreatening environment [Lievrouw, 2010]. It also provides scientists with the means and opportunity to improve the public perception of science while improving general science literacy and integrating scientific discoveries and “citizen science” [Robson *et al.*, 2013] into the lives of nonscientists.

Given the extensive benefits and limited drawbacks of using social media as an outreach and education tool, scientific organizations should utilize opportunities presented by these communication tools to bring high-quality science information into the mainstream. Social media is not the future of communication—it is the present reality—and Earth scientists, eager to share their findings or spur interest in their research endeavors, can be active participants in these emerging conversations.

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