Ideas in Ecology and Evolution 7: 11–16, 2014
doi:10.4033/iee.2014.7.4.f
© 2014 The Author. © Ideas in Ecology and Evolution 2014
Received 18 December 2013; Accepted 14 March 2014

Future of Publishing

Lights, camera, science: The utility and growing popularity of film festivals at scientific meetings

Erica R. Staaterman, Ashwin A. Bhandiwad, Philip M. Gravinese, Perri M. Moeller, Zachary C. Reichenbach, Andrew A. Shantz, David S. Shiffman, Lauren T. Toth, Alexandria M. Warneke, and Austin J. Gallagher

Erica R. Staaterman (estaaterman@rsmas.miami.edu), Beneath the Waves Incorporated, Syracuse, New York, USA and *Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida, USA*

Ashwin A. Bhandiwad (abhandiwad@gmail.com), Beneath the Waves Incorporated, Syracuse, New York, USA and *Department of Psychology, University of Washington, Seattle, WA, USA*

Philip M. Gravinese (pgravine@my.fit.edu), Beneath the Waves Incorporated, Syracuse, New York, USA and *Department of Biological Sciences, Florida Institute of Technology, Melbourne, FL, USA*

Perri M. Moeller (perri.m.moeller@gmail.com), Beneath the Waves Incorporated, Syracuse, New York, USA and *Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida, USA*

Zachary C. Reichenbach (zcreichenbach@gmail.com), Beneath the Waves Incorporated, Syracuse, New York, USA

Andrew A. Shantz (shantz.a@gmail.com), Beneath the Waves Incorporated, Syracuse, New York, USA and *Department of Biology, Florida International University, North Miami, Florida USA*

David S. Shiffman (david.shiffman@gmail.com), Beneath the Waves Incorporated, Syracuse, New York, USA and *Leonard and Jayne Abess Center for Ecosystem Science and Policy, University of Miami, Coral Gables, Florida, USA* and *RJ Dunlap Marine Conservation Program, University of Miami, Miami, Florida, USA*

Lauren T. Toth (ltoth2009@my.fit.edu), Beneath the Waves Incorporated, Syracuse, New York, USA and *Department of Biological Sciences, Florida Institute of Technology, Melbourne, FL, USA*

Alexandria M. Warneke (a.warneke@yahoo.com), Beneath the Waves Incorporated, Syracuse, New York, USA and *San Diego State University, San Diego, California, USA*

Austin J. Gallagher (agallagher@rsmas.miami.edu), Beneath the Waves Incorporated, Syracuse, New York, USA and *Leonard and Jayne Abess Center for Ecosystem Science and Policy, University of Miami, Coral Gables, Florida, USA*, and *RJ Dunlap Marine Conservation Program, University of Miami, Miami, Florida, USA*

Preamble

Scientific publications have traditionally been viewed as the fruit of a scientist's labor. Publishing in the peer-reviewed literature is the gold-standard method for communicating research products to other researchers. Yet today, the greater population of academics and researchers are increasingly recognizing the value of non-traditional scientific research products (Bickford et al. 2012, Ecklund et al. 2012), and certain funding agencies are now asking scientists to list 'products' rather than just 'publications' on their proposals (Piwowar 2013). But how can scientists gather and learn about these different research products and use this as a

This work is licensed under a Creative Commons Attribution 3.0 License.

catalyst for their own efforts? Perhaps the most universal venue for this is the scientific meeting where attendees are given the opportunity to present their research and current activities to the greater community. The inherent value of traditional scientific meetings is beyond question; however, as funding constraints and the importance of broader impacts become increasingly widespread within the professional scientific community, the 'scientific meeting' is evolving to include such products. Importantly, it must also evolve further to encompass an even larger community, promote skills and development, and formalize the opportunities for novel inspirational catalysts for dialogue.

The traditional components of scientific meetings (i.e., oral presentations and poster sessions) have always been—and will likely continue to be—the cornerstone of these gatherings; however, there are innovative opportunities to step outside the traditional norms of meetings, add increased value, and avoid year-to-year redundancies that can limit attendance. There is also some indications that most of the 'action' at meetings may occur at more informal break-out discussion that eclipse the static, formalized talk (Recchia 1999, Fox 2012). This is even more important given the current climate beleaguered by funding cuts that often limit the opportunity to attend meetings which can be an expensive enterprise. Meeting activities that attract and match the interests, needs, and values of students, early-career, and established professionals—who are interested in new concepts and how scholarly products are created and disseminated—will likely enhance the appeal and success of future scientific conferences (Tomazou and Powell 2007, Byrnes et al 2013). In a world dominated by 21st century technology, showcasing new and popular forms of scientific communication is one creative way to achieve this goal (Bubela et al. 2009). As a result, several meetings now have components geared towards outreach, such as hands-on workshops, educational excursions, and hosting film festivals. For example, the 2013 AAAS Meeting in Boston, MA included a day-long "Communicating Science" seminar which presented sessions on communicating to policy makers and reporters, engaging with social media, and visualizing science.

The concept of a film festival at a meeting is a new and dynamic concept that underpins an alternative research product, and method of outreach and communication for researchers: scientific storytelling through filmmaking. These products lie at the interface between the domains of scientific publishing and broader impacts, and can thus serve many purposes. Here, we discuss the added value of incorporating film-based communication platforms (specifically film festivals) into scientific meetings. We also illustrate existing film programs as case studies. Finally, we provide a basic set of recommendations to guide those interested in starting their own film festival at a scientific meeting to promote the success of future endeavors.

Short films as research products

Scientists have long used video to collect data and document the scientific method. Today's cameras are portable, user-friendly and offer incredible image quality for a fraction of the cost of professional equipment, making them especially well-suited for ecologists and evolutionary biologists, who spend considerable time in the field (Figure 1A). Indeed, we now live in a time where a video created by mounting a camera on an

Figure 1. (A) Many field-based ecologists are increasingly using cameras to capture video for documenting their research and creating stories that can connect with a variety of people, from scientists to the general public (Photo: Day's Edge Productions; www.daysedgeproductions.com). (B) Film festivals at scientific meetings represent a relatively new yet useful and valuable avenue for the dissemination of these products. Pictured is a screening of the Beneath the Waves ™ Film Festival at the Benthic Ecology Meeting in Savannah, Georgia in March 2013. Attendance at this specific festival was 452 people (in two separate, scheduled screenings) of an estimated overall conference attended of over 600.

eagle can be viewed by several millions of users and become digital 'front-page' news (http://www.huffingtonpost.com/2013/09/18/eagle-point-of-view_n_3947923.html). Furthermore, field studies are increasingly using new mobile technologies to capture data, such as iPods to record video of bee pollination (Lortie et al. 2012), as well as apps that crowd-source data collection with smartphones. Taken together, these examples suggest that society has an inherent interest in scientific and ecological content that can be portrayed visually, and is now equipped with media and tools to engage in aspects of science themselves.

Short scientific videos and/or films can frame their narratives based on the storylines from scientific research. For example, the concept of a 'video abstract' is a useful way of distilling one's science into a short and informative product; indeed, some journals are now including these alongside published papers (i.e. Functional Ecology). For example, a recent publication on white shark ecology published in the open-access journal PLoS ONE received ~5,800 views in the first month, while the corresponding video abstract (4 minutes and 32 seconds in duration, linked to the 'Comments Section' and embedded in the same press release) gathered ~10,000 views over the same time period (Fallows et al. 2013). While this example includes a study species of wide appeal and interest to the general public, the nearly 50% increase in video abstract views highlights the appeal and utility of this alternative research product. This implies that there is an audience for scientific videos, and that they also have potential for driving increased traffic and exposure to the corresponding published articles.

More than ever, scientists are working to engage the public in a collective effort to increase scientific literacy. Initiatives range in their scope of actual engagement (virtually versus directly), but may include activities such as blogging, giving public presentations, producing media that appeal to the masses, and directly involving citizens in research. Bridging the gap between scientists and the general public is a step that is especially important as more and more ecosystems worldwide are being threatened with each passing year. By recording and editing short films (which has become a very user-friendly enterprise, although not discussed here), ecologists can now turn their fieldwork and data collection into an engaging adventures that simultaneously communicates not only the broader impacts of their research but also captures their passion for the science of nature. This can provide a new perspective that makes the science relatable and even personal—an angle that is generally overlooked in big-budget nature documentaries. Scientists can use their films as means for teaching and inspiring colleagues to utilize these methods to tell stories of their own. Furthermore, the films created can easily be shared with the both the scientific and public communities.

Screening to scientists

Perhaps the easiest method for a scientist to disseminate a film product is to upload the content to an online viewing platform (e.g., Vimeo, www.vimeo.com; YouTube, www.youtube.com, etc.). Today we live in a video-phillic world: Youtube alone generates over 1 billion unique visitors per month, with over 6 billion hours of videos being watched per month and 100 hours of video being uploaded to the website per minute (http://www.youtube.com/yt/press/statistics.html). While these statistics are impressive, they also show the high degree of noise and difficulty in standing out among the masses. Uploading a science film to this platform is useful in generating an online home for one's content; however, this method does little to reach new audiences if the film merely sits expectantly online. Film festivals are an ideal way to bring people together to view video productions; yet, because most scientists lack training in professional filmmaking, the idea of submitting to a film festival can be intimidating. On the other hand, film festivals held at scientific meetings cater explicitly to the growing crop of film-savvy ecologists and early-career scientists and can, therefore, help eliminate such trepidation. Debuting films in a comfortable and familiar venue such as a scientific meeting can be highly rewarding for scientists wishing to use film as a research communication tool. Indeed, some scientific societies have been including films at their annual meetings for decades (e.g., Animal Behavior Society). Yet, since 2010, film festivals at conferences seem to be increasing in frequency and scale, and have even become a core event at several scientific meetings (see Table 1 for a few examples).

The integration of a science-based film festival (multiple films shown in a session format) at a meeting can potentially have multiple impacts. First, it breaks up the schedule of a typical conference and provides an additional stimulating and entertaining event to those in attendance. Second, while a film session essentially mimics the style of the more traditional oral presentations, the message of the scientists whose work is featured can be amplified. For example, assuming a total conference size of ~700 people with multiple concurrent sessions, the audience at even the most popular oral presentations is likely to be less than 100; yet if a film festival is billed as a 'main event' of the meeting agenda, the audience size drastically increases (Figure 1B). The screening of a film also provides an opportunity for those scientists who could not attend the meeting to still share their work, which is a bonus that is generally not the case for the more 'traditional'

Table 1. Examples of film festivals that are currently being used in conjunction with well-established scientific meetings (this is not an exhaustive list).

Meeting	Focus	Name of Film Festival	Year
Benthic Ecology Meeting	Marine ecology	*Beneath the Waves Film Festival*	2010–2014
Western Society of Naturalists	Marine ecology	*Beneath the Waves Film Festival*	2013
Evolution	Evolutionary science	*Evolution Film Fest*	2011–2013
Ocean Sciences Meeting	Marine sciences	*Ocean Sciences Film Festival*	2012
Association Sciences Limnology and Oceanography	Marine/aquatic science	*Aquatic Sciences Film Festival*	2011
American Association for the Advancement of Science	General science	*Science Film Showcase*	2014
American Geophysical Union	Physics/geological science	*AGU Cinema*	2012–2013
Science Online	Science communication	*Cyberscreen Film Festival*	2011–2012

components of meetings (especially oral talks). Furthermore, the social 'spotlight' that is placed on those who entered films in the festival will serve as positive reinforcement of their science communication efforts. Screening research-based films also provides the featured scientists additional value for their meeting travel expenses as well as valuable experience in science communication. As a corollary, seeing the work of their peers on the big screen can inspire the greater scientific community, spark interest, and motivate them to seek out additional training in science communication, which is generally lacking in most graduate and undergraduate science programs (Leshner 2007). As film festivals become attached to the annual agendas of meetings, they can become something special that the community looks forward to every year (authors, direct observation).

The Beneath the Waves model

The Beneath the Waves™ Film Festival (BTWFF; www.beneaththewavesfilmfest.org) presents an exemplary case study of the scientific film festival phenomenon. BTWFF is a student-run educational and outreach platform that uses digital media and filmmaking to communicate marine science and conservation to the public while also helping scientists create their own short films. This group began in 2009 through a partnership with the Benthic Ecology Meeting, an annual gathering of marine ecologists, which takes place in the eastern United States. Our partnership with the Benthic Ecology Meeting offers between one and two sessions of ocean-related films (all films are less than 15 minutes each) to attendees. The festival often includes a number of films from scientists in attendance at the meeting. Of the 129 total films accepted and showcased from 2010-2013, approximately 65% were made by professional scientists, with ~60% of these scientist entries produced by undergraduate or graduate students (BTWFF, unpublished data; Figure 2). Moreover, of the 277 scientists whom completed surveys at the 2013 BTWFF with the Benthic Ecology Meeting in Savannah, Georgia, approximately 56% claimed that they had considered making a film at some point prior to the event; however, after viewing the festival, over 50% of those surveyed said they were either somewhat or definitely more likely to make a film about their research (BTWFF unpublished data). Our preliminary data suggest that, at least within one scientific society, film festivals can stimulate a greater interest in science communication and motivate the audience to consider changing their behavior. Behavioral modifications could include trying out new ways of communicating one's research, spurring ideas for creating short films that relate to a specific research project or publication, incorporating more film-based science activities at their university or lab, to even hosting their own film festival.

BTWFF continues to work alongside the Benthic Ecology Meeting annually (averaging around 400 scientists as audience members per annual meeting), but

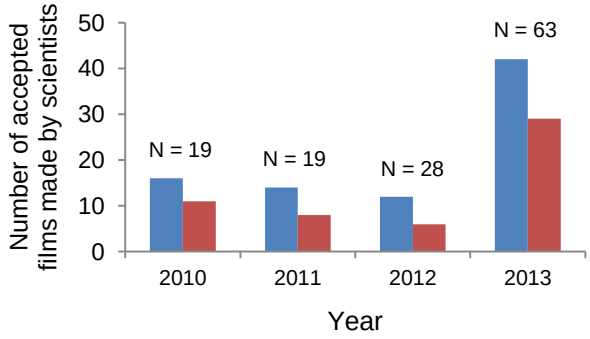

Figure 2. The number of films produced by active marine scientists (professionals and students; blue bars) and undergraduate and graduate students alone (red bars) which have been accepted and screened in the Beneath the Waves Film Festival since 2010 (the total number of films accepted each year designated by 'N').

has also expanded to host screenings at universities, community centers, and local theatres in 15 countries worldwide. These events include the screening of 5 to 15 films, followed by a live question-and-answer session between a panel of scientists and the public. Additionally, in 2013, BTWFF launched a new initiative called Youth Making Ripples, which is a program aimed to educate K–12 students about the importance of scientific research related to ocean and coastal communities, while also challenging the students to create short marine science related films of their own. This is one of the ways in which a science-based film festival can evolve over time to target additional audiences and foster scientific communication at a much larger scale.

This approach could readily be used as a template for scientists interested in creating their own unique film sessions or festivals at meetings across the scientific disciplines: once a group of interested scientists generates a goal or message for their film festival, they are encouraged to pitch the details of their proposed event to a scientific meeting (Figure 3). After the festival is launched, they should create criteria for the types of films they want to screen and promote their call for submissions to scientists and others in the field. Interested groups are encouraged to reach out to those who are already involved in existing festivals for queries and advice on how to enhance success and avoid pitfalls that could limit future opportunities (especially from any skeptics of science communication which certainly exist within societies). Festivals should also strive for originality in their design and scope (including a distinguishing name).

The BTWFF model highlights the fact that professional scientists and students can work together to create, aggregate, and showcase meaningful film-based programming within meetings. These events facilitate communication of scientific research and provide the opportunity to expand to international audiences, thus amplifying outreach efforts beyond the scientific community to the general public.

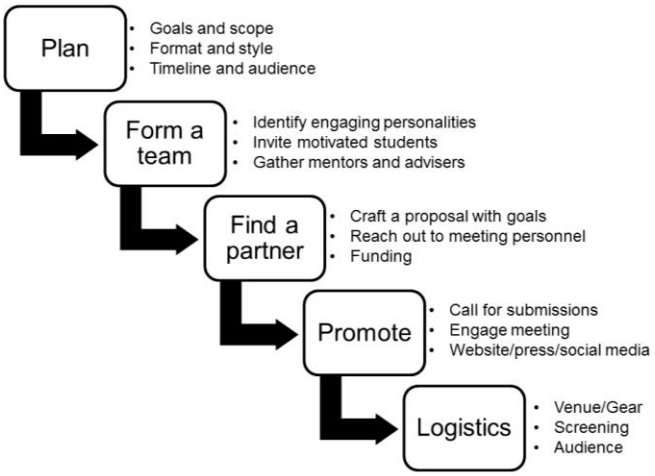

Figure 3. A basic flow-chart of the process and guidelines for scientists interested in creating their own film festival and implementing it into an existing scientific meeting ('the partner').

Outlook

Film festivals can add value to scientific meetings, highlight the work of individuals that may otherwise be overlooked by the saturated pool of talks, and (perhaps most centrally) inspire the community to explore new ways of communicating their research. While we argue that the true communication and outreach potential of films are greater when displayed physically to people in person, films can also experience great success virtually: they can be posted online to various channels, they are open-access, they can be accessible to all, and they can promoted in different ways than a scientific paper. Yet, most pivotally, this greater phenomenon permits the emergence of leaders in their field and contributes to the evolution of science and science communication (Lortie 2012).

We argue this phenomenon is borne from both the publishing and science communication domains. We have already seen a marked increase in the value of outreach in the priorities of funding agencies such as the National Science Foundation, among others (Shipman 2012, Piwowar 2013). Further, the experience attained when one's work is presented at a science-based film festival may become increasingly valuable when science communication and outreach become part of an integrated metric for gauging the productivity and success of academics and professional scientists. Also, scientific meetings, in general, are becoming more accessible to the interested public via tools like social media (Shiffman 2012), thus increasing and amplifying the impact of the attendees' work.

Alternative research products such as films and film festivals may not appeal to every scientist, yet we hope we have provided evidence for one tool that may present scientists real value beyond solely meeting the 'broader impacts' mandates of funding agencies. Scientists should look out for existing festivals to which they can submit their films. Additionally, we encourage ecologists and evolutionary biologists of all fields to create and/or host their own festivals at scientific meetings, and we challenge all others to embrace them, as they are one of the many signs of a brave new world in the scientific and publishing communities.

Acknowledgements

We would like to thank our current and respective graduate advisors and mentors who have supported our ongoing efforts in science communication over the years, especially in the creation and development of Beneath the Waves, Inc., namely J. Long, J. Pawlik, S. Powers, M. Butler, D. Gleason, M. Gilg, R. Tankersley and S. Genovese, and the Benthic Ecology Society. We also thank each and every filmmaker who has submitted their work to Beneath the Waves through the years.

Referees

Carin Bondar – carinbondar@gmail.com
carinbondar.com

Christopher J. Lortie – lortie@yorku.ca
York University

References

Bickford, D., Posa, M.R.C., Qie, L., Campos-Arceiz, A., and E.P. Kudavidanange. 2012. Science communication for biodiversity conservation. Biological Conservation 151:74–76. CrossRef

Bubela, T., Nisbet, M.C., Borchelt, R., Brunger, F., Critchley, C., Einsiedel, E., et al. 2009. Science communication reconsidered. Nature Biotechnology 27: 514–518. CrossRef

Byrnes, J.E., Baskerville, E., Caron, B., Neylon, C., Tenopir, C., Schildhauer, M., et al. 2013. The four pillars of scholarly publishing: The future and a foundation. PeerJ PrePrints 1:e11v1 http://dx.doi.org/10.7287/peerj.preprints.11v1

Fallows, C., Gallagher, A.J., and N. Hammerschlag. 2013. White sharks (*Carcharodon carcharias*) scavenging on whales and its potential role in further shaping the ecology of an apex predator. PLoS ONE 8: e60797. CrossRef

Fox, J. 2012. Advice: how to network at conferences. Oikos Blog 4 April http://oikosjournal.wordpress.com/2012/04/04/advice-how-to-network-at-conferences/

Leshner, A.I. 2007. Outreach training needed. Science 315: 161. CrossRef

Lortie, C.J., Budden, A.E., and A.M. Reid. 2012. The birds and the bees: applying video observation techniques from avian behavioural ecology to invertebrate pollinators. Journal of Pollination Ecology 6: 125–128.

Lortie, C.J., 2012. Hänsel und Gretel: The future of publishing wicked witch-free. Ideas in Ecology and Evolution 5: 99–102. CrossRef

Piwowar, H. 2013. Altmetrics: value all research products. Nature 493: 159.

Recchia, P. 1999. How to work a scientific conference. Science Careers 8. Oct. http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/1999_10_08/nodoi.2496248183250982679

Shiffman, D.S. 2012. Twitter as a tool for conservation education and outreach: what scientific conferences can do to promote live-tweeting. Journal of Environmental Studies and Sciences 2: 257–262. CrossRef

Shipman, M. 2012. SciComm matters because… funding agencies say so. SciLogs 5 Dec. http://www.scilogs.com/communication_breakdown/scicomm-matters-funding/

Tomazou, E.M., and G.T. Powell. 2007. Look who's talking too: graduates developing skills through communication. Nature Reviews Genetics 8: 724–726. CrossRef