Communicating Science: Video as a Medium for HAB Outreach

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Abstract

Communicating science to the public in a clear and effective manner is challenging. Now consider how difficult it is to attempt to communicate a complex scientific topic that is also a potential threat to human and animal health and rife with controversy, and political and economic implications. That scenario describes the intrinsic difficulty in harmful algal bloom (HAB) outreach. As part of two separate grant-funded research projects into HABs, two outreach videos were created. The two videos will be used to illustrate various considerations that go into the creation of outreach videos. We will briefly describe the video production process, discuss lessons learned, and provide information on inexpensive, often free, resources for video content and dissemination. The lessons learned from the production of the videos may be helpful to other scientists as they consider multimedia products to communicate their research.

Introduction

Communicating science to the public in a clear and effective way is challenging. It requires an understanding of science and the scientific process, as well as the ability to convey that science to the scientific community, public and policy makers in an understandable manner. Now consider how difficult it is to attempt to communicate a complex scientific topic that is also a potential threat to human and animal health and rife with controversy, and political and economic implications (Nierenberg in prep, Hoagland 2009). Potential outcomes could produce public fear or worse, apathy. That scenario describes the intrinsic difficulty in harmful algal bloom (HAB) outreach, considerations we took into account in the creation of two outreach videos on the human health aspect of two harmful algal blooms. We will briefly describe the video production process, discuss lessons learned, and provide a few tips for researchers interested in engaging in video as a medium for outreach.

Why Choose Video to Disseminate Science?

In a recent article in the journal Science, researchers who used video to communicate their curriculum found that video was a crucial tool in conveying complex concepts in an understandable way; providing a level of understanding that would have otherwise been next to impossible to deliver using academic lectures or textbooks (Schneps \textit{et al.}, 2010). For instance, “Reef or Madness”, a short film we created on the controversial diagnosis of chronic ciguatera fish poisoning, gives attention to gaps in research and traditional medical literature about the subject.

Pre-Production Considerations

There are a number of questions to consider before beginning any actual filming or video production. Answers to these questions can help create an effective, targeted outreach product, and potentially save dozens of hours of labor and hundreds to thousands of dollars in expenses for rewrites of the script or revisions of the video.

Defining the audience

The first step, whatever the medium, should be defining the primary audience. Will outreach be directed toward the public in general or a specific segment of the population? Perhaps outreach is geared toward policy makers or agency personnel. Are they within the subject discipline or outside? If students are the intended audience, what level? K-12, undergraduate, or graduate? It is extremely important to determine the primary audience because this dictates the knowledge level at which the subject matter will be aimed.

Purpose of the video

The next step involves determining the purpose of the video. Will the video be used to educate students, recruit field study participants, or engage policy makers? Perhaps the purpose is just to get the science out there. Regardless, the purpose should be specific and narrow. For example, when we created the outreach video “Red Tide Research in Paradise”, as part of our NIEHS P01 aerosolized Florida Red Tide
Research grant, the purpose was to recruit asthmatics to participate in a field study. An outreach product that deals with multiple purposes is often too long and has either an unclear or watered down message.

**Supporting Messages**
To keep the video concise and impactful, choose three-five messages (AAAS 2008) to support the purpose of the video. Referring again to “Red Tide Research in Paradise”, we used three messages within the video to show prospective asthmatic participants 1) what they could expect should they decide to volunteer; 2) why their participation was important to our research; 3) and that participating in the study was safe.

**Production Process**
Creating an outreach video is a lot of work; experienced outreach and education professionals do not enter into it lightly. A short, well-produced video, even a few minutes long, can take months to produce. Consider that creating an outreach video is like planning a research study and carrying it out. Develop the idea (conduct background research); write a proposal (synopsis/treatment); carry out the study (film/interview); analyze the data (review footage); prepare the publication (script); and communicate the research (editing/post-production).

When producing videos, there is a rule of thumb that will help guide video length:
- 30 sec – 2 min: simple, single subject clips
- 3 – 5 min: how-to/process-oriented videos
- 5 – 7 min: informative content, no narrative
- Up to 15 min: narrative-style where the story drives viewer interest.

Expect to “shoot” 10-30 minutes of video for every 1-minute used in the final product. Depending on a number of variables, such as the creation of complex animations, graphics and music/sound effects, narration, multiple shoots, and scheduling issues, production time can run anywhere from one-two weeks per 1 minute of video, up to 6 months to a year for a 15-20 minute piece. Writing and editing (and re-editing) the script can take up to half of the total production time. The entire process is time-consuming, especially if filmmaking is unfamiliar, but it can be extremely rewarding, providing a product for posterity.

**Engaging the Public**
A simple technique to engage the public in an outreach video, getting them to care about the research or a complex topic, is to “bookend” the video with a personal story or element that demonstrates how the research personally affects their lives. “Reef or Madness” was bookended with a very engaging victim of ciguatera. The film began with him and ended with him, with science and additional personal stories in the middle. Bookending the video with his personal story invested the public in the narrative and they were compelled to watch the entire video to find out what happened to him.

**Lessons Learned**
Even though our production team included a journalist and documentary filmmaker, as well as a scientist who was also an experienced outreach and education communicator, the endeavor of creating scientific outreach videos posed a few challenges.

- **Opposing communication styles:** An important point to consider is that the method of communicating science to scientists is opposite how scientific outreach should be communicated to the public (figure 1: source AAAS 2008). Researchers present background information, then supporting facts, and finally close their scientific presentation with results and conclusions. However, the public expects a story to lead with the main point (conclusion), followed by the “so what”, to establish why they should care about the details to follow. Writing the script for “Red Tide Research in Paradise”, exposed how the differing communication styles can impair the traditional collaborative scientific writing process.

- **Implications HAB outreach:** The “Red Tide” script was carefully word-smithed to avoid unduly alarming tourists and locals about the human health effects of Florida Red Tide.

- **Release forms:** Everyone involved in the research, the film and the filmmaking process must sign a release form to avoid potential ownership or fiscal liability problems.

- **Set realistic expectations:** People interviewed on camera for 30-40 minutes and included in
only 15 seconds of the video, have a tendency to get quite disappointed. Set their expectations low and surprise them later.

- **Set a deadline**: A definitive deadline compels all parties involved in the production to adhere to a timeline. For “Reef” our deadline was a film festival; for “Red Tide”, it was a scientific conference.

**Resources**

There are numerous resources for acquiring inexpensive (often free) graphics, photographs and video to supplement a HAB outreach video, especially if the video is for educational purposes or created by students.

New mediums like YouTube™, and many other video content websites can provide a connection to filmmakers who are often very willing to give their content for free provided they are credited properly and the outreach video is educational and not-for-profit. We found an animated cartoon illustrating how the dinoflagellate *Gambierdiscus toxicus* affects the food chain from fish to humans on YouTube™, and used it in “Reef”. We contacted the animator who created the video and he allowed us to use the cartoon for free provided he was given credit in the end credits.

It was also valuable to ask around. Many of the photographs and video clips used in the two HAB videos were provided for free by colleagues, students, researchers from around the world, interested only in getting their research out there.

**Leveraging Resources**

Video production can cost upwards of $1000 per minute in production expenses. However, both HAB videos were created for under $200 each. Institutional resources were leveraged to make this happen. For “Reef”, film school students from the University of Miami did much of the filming and editing. Using university equipment saved hundreds of dollars in equipment purchases or rental fees.

**Outlets for Video Outreach**

YouTube™, Vimeo™ and Facebook™, are just a few video content websites who offer free posting of videos. However, there are others means of getting outreach out there. Science Centers, aquariums, museums, and scientific conferences may all offer options for presenting a video. Consider using home institutional websites or “piggy-backing” on an agency websites, many are looking for well-made, scientific video content to supplement information or increase traffic on their websites.

**Conclusion**

Video as a medium for HAB outreach is challenging, but often well worth the effort. HAB scientists are perfectly poised to show the public that research into HABs directly affects them, and could actually help protect them and their families, whether it is through avoidance of HABs or potential beneficial medical treatments and pharmaceuticals some HAB species may provide. There can be helpful news in harmful algal blooms!

At a time when funding agencies increasingly require scientists to bring their research directly to the public, researchers can choose to go beyond press releases and publications (AAAS 2008), creating short but effective outreach videos that communicate science while educating and engaging the public.

To view “Reef or Madness” and a narrated Powerpoint movie of this presentation, visit the Univ. of Miami NSF NIEHS Oceans and Human Health website: [www.rsmas.miami.edu/groups/ohh](http://www.rsmas.miami.edu/groups/ohh)


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