Science Communication in a Digital Age: Social Media and the American Fisheries Society

Julie E. Claussen
Illinois Natural History Survey, University of Illinois, 1816 S. Oak St., Champaign, IL 61820. E-mail: juliec@illinois.edu

Patrick B. Cooney
Smith-Root, Vancouver, WA

Julie M. Defilippi
Atlantic Coastal Cooperative Statistics Program, Arlington, VA

Sarah Gilbert Fox
American Fisheries Society, Bethesda, MD

Sarah Michele Glaser
Department of Biology, College of William and Mary, Williamsburg, VA

Elden Hawkes
USDA NIFA Institute for Bioenenergy Climate, and Environment, Washington, DC

Clifford Hutt
NOAA Fisheries, Highly Migratory Species Management Division, Silver Spring, MD

Marissa H. Jones
School of Aquatic and Fishery Sciences, University of Washington, Seattle, WA

Iris M. Kemp
Washington Cooperative Fish and Wildlife Research Unit, University of Washington, Seattle, WA

Aaron Lerner
American Fisheries Society, Bethesda, MD

Stephen R. Midway
Pennsylvania Cooperative Fish and Wildlife Research Unit, Pennsylvania State University, University Park, PA

Shivonne Nesbit
Oregon Division Fish and Wildlife, Salem, OR

Jeremiah Osborne-Gowey
Feather River Consulting and Oregon State University, Corvallis, OR

Ryan Roberts
National Fish Habitat Partnership, Washington, DC

Cleve Steward
AMEC Earth and Environmental, Inc., Seattle, WA

ABSTRACT: *Social media platforms are effective tools used to help communicate and increase involvement in cultural, political, and scientific circles. In 2012, an ad hoc committee was established to explore online fisheries science communication and how social media platforms can be utilized by the American Fisheries Society (AFS). A survey was disseminated to all AFS units (chapters, sections, divisions) and student subunits to better understand the current use of social media within the AFS. A relatively high response rate (82%) provided some confidence in the survey results—namely, that nearly 69% or more of units and subunits used social media. Facebook was the dominant platform used (59%; all others < 15%) and almost exclusively (97%) for the purpose of communication. Education, outreach, and member recruitment were other reasons for social media use. Finally, whether units currently use social media or not at all, it was recommended that AFS-led workshops and assistance would increase the usefulness of social media.*

ONLINE SCIENCE COMMUNICATION AND THE AMERICAN FISHERIES SOCIETY

> *"... if scientists could communicate more in their own voices—in a familiar tone, with a less specialized vocabulary—would a wide range of people understand them better? Would their work be better understood by the general public, policymakers, funders, and, even in some cases, other scientists?"* *Alan Alda*

The What and Why of Social Media

The term "social media" describes the various forms of online technologies—often referred to as "platforms"—that were developed to form virtual communities for sharing information, cultivating discussions, and building relationships. For example, Facebook, Twitter, and blogging are all common forms of social media used both in popular culture and science. Though social media platforms were designed for the purpose of individuals engaging socially online, these tools have grown far beyond displaying that perfect batch of French toast to your friends. With their almost-instant popularity and growth, businesses; nongovernmental organizations; local, state, and federal agencies; and professional societies have discovered the benefits of tailoring these platforms for their own uses as a powerful and cost-effective method of reaching the masses and building an audience.

The choice to delve into social media is a personal decision, and some fisheries scientists will see it as a hindrance to their already overloaded schedules, whereas others view its use as a vital part of their career enhancement. There have been a number of recent articles, including those in peer-reviewed journals, that stress the benefits of the scientist taking an active role in

online communications (Regenberg 2010; Fausto et al. 2012; Bik and Goldstein 2013; Ogden 2013). Social media platforms (see text box) have been likened to office water-cooler discussions, or a virtual cocktail party, where you can listen in or take part in a variety of conversations. The ability to "eavesdrop" on these conversations provides insight into what is being said, who is saying it, and who is listening. It is the scale of this virtual party that gives social media its power. How many cocktail parties have you attended where established scientists, early career biologists, undergraduates, graduate students, teenagers, general public, authors, conservationists, anglers, etc., all convene and exchange information in one place?

Whether you view social media as a colossal waste of time or a remarkably advantageous tool, it is the way the world is networking and communicating. The data showing its usage can be a bit staggering (Foster 2012; The Nielsen Company 2012), with over a billion active Facebook users in 2012, 23% of whom check Facebook five or more times daily. In the United States alone there are over 100 million active Twitter users and, of these, 40% do not use Twitter to post but, rather, use their Twitter feed to gather information. Most enlightening is the analysis on what Twitter users retweet (information they pass along to others). The number one item users shared was interesting content, beating out humor, celebrity status, and personal connections. Think of that trout fisherman trolling (pun intended) his Twitter feed looking for new information on his favorite sportfish to share with other anglers. In the 2012 Nielsen report, the State of the News Media, Pew Research Center's Project for Excellence in Journalism, listed social media, with Facebook in the lead, as a critical news source. If the growing trend continues, most of the world will go to social media as *the* way to get information, including scientific news.

Though there is much to be written about the benefits of the individual fisheries professionals engaging in online communication, the topic we address here is how the American Fisheries Society (AFS) can directly benefit from an active presence in social media communities. In light of the increasing role of social media in science, AFS President John Boreman appointed an ad hoc science communication committee to assess how the society (1) could use social media to communicate and connect membership and (2) could leverage social media platforms to share member-generated scientific information with those *outside* the society.

The discussion about how the AFS can best communicate both among its membership and beyond the society (i.e., committee objective 1) is not a new one. The history on the development of society guidelines for advocacy (which addresses education and outreach) is an interesting one and can be reviewed on the society's website (fisheries.org/policy_advocacyguidelines). Effective communication, education, and outreach have been a reoccurring theme in the society's strategic plans, including the current one (*AFS Strategic Plan 2009–2014*, Objectives 1.1, 3.1, 3.2, 3.4), and are often included in the yearly plan of work. With the rapid growth of new online tools for networking, there are many questions to tackle when considering social media and the AFS: How do other professional societies benefit? Is the current level of engagement enough?

WHAT IS SOCIAL MEDIA?

Definition: ***Term used to describe a variety of Internet-based platforms, applications, and technologies that enable people to interact. Platforms are meant to be community-based, through which users create online communities to interact, collaborate, and share information, content, ideas, and personal messages.***

Prominent examples of social media:

- **Blogs**: Short for ***Web log***; a blog is a publicly accessible webpage that provides commentary on a particular subject or theme.
- **Facebook**: A free social networking website that allows registered users to create profiles, pages, and groups to post messages and share content, such as websites, photos, or video.
- **Flickr:** A free online service that allows registered users to upload and share photos and video clips.
- **Google Groups:** A free service from Google Inc. that provides a forum for collaboration and discussion groups.
- **Google+:** A free social networking service that allows users to share updates and communicate selectively with different groups (called "circles").
- **Google Hangout**: A free video chat service from Google that focuses on group interaction and enables group chats with up to ten people at a time.
- **HootSuite** (free and $): A social media management system that enables teams to collaboratively execute campaigns across multiple social networks from one dashboard.
- **Instagram:** A photo sharing platform, allowing users to follow and comment on uploaded images.
- **LinkedIn**: A free social networking site designed to allow registered members to establish and document networks of people they know and trust professionally.
- **Pinterest**: A free social curation website where the main focus is visually sharing and categorizing images found online.
- **Reddit:** A free new curation site, where readers vote on the best news and can set up subreddit news.
- **Scoop.it:** A publishing platform that allows anyone to create an online magazine centered around a particular topic.
- **Storify:** A social network service that allows the user to create stories by dragging individual elements from other stories from social media sites such as Facebook and Twitter.
- **StumbleUpon**: A free site that recommends websites, photos, and videos based on your usage and input.
- **Tumblr**: A free blogging platform that allows users to post text, images, videos, links, quotes, and audio to their tumblelog.
- **Twitter**: A free microblogging service that allows members to follow other users and/or broadcast their own character-limited posts called "tweets."
- **Vimeo:** A free service that allows users to upload and share videos.
- **Vine:** A free Twitter-like service that, instead of 140 characters, the user makes/posts 6-second videos.
- **Wikipedia**: A free, open content online encyclopedia created through the collaborative effort of a community of users.
- **YouTube:** A free service that allows registered users to upload and share videos.

Who should evaluate this engagement? What platforms best suit the AFS's needs? How can the AFS capitalize on the talents of our membership? What level of online science communication support should the parent society provide?

Our Members

The first step toward addressing these questions was to gather baseline information on the current status of social media use in the AFS. The science communication committee constructed a web-based survey to assess how individual AFS units and subunits use social media to connect to their membership. The survey was sent out to the presidents of all AFS units (chapters, sections, divisions) and student subunits (note: the sample of student subunits was limited by the contact information available and is admittedly underrepresented). Of the units and subunits contacted, we received an 82% survey response rate, providing the committee with numerous beneficial insights into social media usage. Overall, 74% of respondents reported that their units use some type of social media. Of those units that were not currently using social media, 28% said their membership indicated that they were interested in using it in the future. Student subunits comprised the largest percentage (90%) of AFS social media users, followed by sections (72%) and chapters (69%). The most popular form of social media use was Facebook (59%), followed by (in order of use) Twitter (14%), blogging (9%), Google Groups (7%), LinkedIn (5%), YouTube (5%), and Google+ (4%). Responses varied widely as to whether units had plans to integrate any of these platforms in the future.

The majority of units that engaged in some form of social media used it to communicate within their unit's membership (97%). Other reasons listed for units adopting social media included adapting to changing times (65%), education and outreach (49%), communicating with nonmembers (49%), attracting younger members (46%), and use requested by membership (16%). Fewer than 30% of respondents listed used social media to communicate with recreational anglers, the angling industry, the commercial community, or the media.

When asked what kind of content they provided through social media, AFS units indicated that they primarily provided information about unit meetings (85%) and activities (80%), fisheries-related news and studies (63%), jobs and graduate school positions (61%), national and regional meetings and conferences (51%), grants and scholarships (47%), and award announcements and nominations (47%).

THE PARENT SOCIETY

The survey also addressed what services and assistance the units would like the parent society to provide. The top two requests for assistance from units that currently use some form of social media were for workshops that provided guidance and tools for effective communication (60%) and articles in *Fisheries* that focused on online communication (60%). Other suggestions on how the parent society could support units' social media use were providing how-to guides on social media tools (47%), increasing the AFS's own presence on social media (45%), guidance on appropriate content to post via social media (40%), and personnel at the parent society to assist units with social media (28%). For units that did *not* use any form of social media, the top three requests for assistance included hosting workshops that provided guidance and tools for effective communication (59%), personnel assistance from the AFS to assist units (59%), and how-to guides (53%).

Three major themes emerged from this survey:

1. The majority of AFS units and subunits are engaged in social media at some level, indicating that this is currently an important form of communication for the membership;
2. Of those units not engaged, individual assistance, workshops, and how-to guides were listed as ways the AFS could help, suggesting that if this information was more readily available, social media may be useful to these units;
3. There is significant interest among AFS leadership for the parent society to provide assistance to units on the effective ways of using social media to communicate both within and outside of the society (i.e., an educational and outreach tool).

Although guidance on appropriate content to post to various social media platforms did not rank among the most important ways the parent society could help, the science communication committee is developing a policy for the parent society. The Oregon chapter, a very active user of social media, has already addressed this need and has approved its own social media policy, which will likely serve as a base model for this committee. Current AFS guidelines and policy statements for both advocacy and professional conduct do not address the modern forms of online communications. Those of you who are already engaged in social media are likely aware of differences in communication styles on the various social media platforms, which are typically friendlier, more approachable, and often jovial. Unlike peer-reviewed scientific publications, opinions and personal injections are often incorporated in social media posts; however, social media posts representing the society should stay objective, nonpolitical, and professional. The forthcoming social media policy will address these and provide some goalposts within which media originating from the society can operate.

The survey showed that many of the AFS units either have or are establishing an online presence and are tailoring it to suit their own purposes. Though the parent society has established a Facebook page and a Twitter account, activity has been mostly limited to posts by members and not directly from the AFS. Currently, there is no single strategy in place for how best to reach target audiences or to evaluate success.

Outside of AFS

Several professional societies and scientific organizations have firmly embraced social media, and many have several accounts for their various purposes. The American Association for the Advancement of Science has a strong Twitter following of 14,000+ individuals, as do the National Science Teachers Association and the Union for Concerned Scientists. The Twitter accounts for scientific journals also have strong followings

(Oxford Journals has a following of over 9,000, while the journal *Nature* has half a million followers of @NatureNews). The promotion of new journal publications has resulted in several assessments on the benefits of promoting publications on Twitter and increasing impact factors (Eysenbach 2011; Weller et al. 2011; Shuai et al. 2012; Darling et al. 2013).

In the wide-ranging world of fisheries, there is a strong online audience of anglers, many of whom have embraced social media as a way to gather information about their favorite sportfish. On Twitter alone, the popularity of online angling communities is evident, with the strong following of organizations like Trout Unlimited (>11,000), B.A.S.S. (> 100,000) and Orvis Flyfishing (>16,000). This popularity is not just tied to seeing who caught the biggest fish. Popularity of the accounts of The Wildlife Society (>13,500 Twitter followers), the Monterey Bay Aquarium (28,000 Twitter Followers), and Ducks Unlimited (626,000 Facebook likes) indicates that many people use social media as a source for their natural resource information. There is tremendous potential for the AFS to expand its role as a national resource for fisheries information.

OUR RECOMMENDATIONS

The AFS Science Communication Committee recommends a three-pronged approach for developing social media use by the society. First, to allow for maximum flexibility within a common framework, we recommend developing an AFS policy on the use of social media that can be adopted and adapted by the various units within the society. Second, given the relatively widespread desire among various AFS units, we recommend that the parent society dedicate resources to developing communication workshops and how-to guides for use by the various AFS units. Finally, given (1) the importance of communicating fisheries science with the public in an electronic age, (2) the underutilization of social media platforms by many AFS units, and (3) the relative lack of knowledge on how to best utilize social media among AFS units not currently adopting social media, we recommend developing a strategy for encouraging the judicious expansion of social media usage by all AFS units.

CONCLUSION

In this ever-evolving online world, if there is an unoccupied niche, it will likely be filled. There are currently several groups dedicated to science communication, but how many are focusing on aquatic and fisheries sciences? Are the many anglers who are already online looking for information to be better stewards for fisheries and aquatic environments? Early career fisheries professionals have several choices for being involved in an organization. Are they searching for a society that is relevant with the changing times? We suggest that the AFS use its substantial fisheries science knowledge and take advantage of the current trends in online science communication. If we do not, we may be missing out on an opportunity to promote and advance the exceptional work being done within the society—and, in the process, we might very well watch our membership fall behind.

How are individual AFS members using social media?

We don't know... yet! The Fisheries Information and Technology Section (FITS), in collaboration with the Electronic Services Advisory Board, is interested in how professional and student members of the AFS are using social media for personal and professional communications.

We have developed a survey, distributed to AFS members this summer, that focuses on individual use of social media to determine which platforms are most commonly used, frequency of use, and applications. The results of this survey will tell us how the society's members currently use social media and provide pathways for more effective and timely communications through social media in the future. We will be presenting these results at the social media symposium that FITS and the Electronic Services Advisory Board are sponsoring at the 143rd Annual Meeting in Little Rock. The symposium promises to be a great day for learning about the uses of various social media platforms and providing reasons why you might consider using social media.

The Fisheries and Information Technology Section is currently working to provide assistance to individual AFS members on the use of and best practices for social media. For more information on FITS or the survey, please contact Julie Marie Defilippi, Atlantic Coastal Cooperative Statistics Program, 1050 N. Highland St., Suite 200 A-N, Arlington, VA 22201 (julie.defilippi@accsp.org).

REFERENCES

AFS 2020 vision: AFS strategic plan 2009–2014. Available: fisheries.org/strategic-plan.

Bik, H. M., and M. C. Goldstein. 2013. An introduction to social media for scientists. PLoS Biology 11(4):e1001535.

Darling, E. S., D. Shiffman, I. M. Côté, and J.A. Drew. 2013. The role of Twitter in the life cycle of a scientific publication. Ideas in Ecology and Evolution 1–31.

Eysenbach, G. 2011. Can Tweets predict citations? Metrics of social impact based on Twitter and correlation with traditional metrics of scientific impact. Journal of Medical Internet Research 13(4):e123.

Fausto, S., F. A. Machado, L. F. J. Bento, A. Iamarino, T. R. Nahas, and D. S. Munger. 2012. Research blogging: indexing and registering the change in Science 2.0. PloS One 7(12):e50109.

Foster, B. 2012. Ben Foster Media. Available: www.benphoster.com/facebook-user-growth-chart-2004-2010/. (April 2013).

The Nielsen Company. 2012. State of the media: the social media report 2012. Available: www.nielsen.com/us/en/reports/2012/state-of-the-media-the-social-media-report-2012.html. (April 2013).

Ogden, L. E. 2013. Tags, blogs, tweets: social media as science tool? BioScience 63(2):148. Available: www.bioone.org/doi/full/10.1525/bio.2013.63.2.1. (April 2013).

Regenberg, A. C. 2010. Tweeting science and ethics: social media as a tool for constructive public engagement. The American Journal of Bioethics 10:30–31. Available: dx.doi.org/10.1080/15265161003743497. (April 2013).

Shuai, X., A. Pepe, and J. Bollen. 2012. How the scientific community reacts to newly submitted preprints: article downloads, Twitter mentions, and citations. PLoS ONE 7(11): e47523.

Weller, K., E. Dröge, and C. Puschmann. 2011. Citation analysis in Twitter: approaches for defining and measuring information flows within tweets during scientific conferences. Proceedings of the ESWC2011 Workshop on 'Making Sense of Microposts', Heraklion, Crete, May 30, 2011, pp 1–12.