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About the cover image: Lake Torneträsk and Mt. Nuolja in Sweden on a cloudy night. Image courtesy of Hannah Beck during her Limnology and Oceanography Research Exchange (LOREX). Read more about this NSF-funded initiative at aslo.org/lorex.
What Is in a “Lake” Name? That Which We Call a Lake by Any Other Name

Patricia A. Soranno, Katherine E. Webster, Nicole J. Smith, Jessica Díaz Vázquez, and Kendra Spence Cheruvellil

Abstract
Given how important lakes are to people, it might seem safe to assume that careful thought has been put into the naming of lakes, and that lake names reflect the high societal value people place on lakes. We examined these assumptions by analyzing the official names in the U.S. Geographic Names Information System for the 479,950 lakes ≥ 1 ha in the conterminous U.S. We found that 83% of lakes were unnamed and most of these were small lakes with 80% of unnamed lakes being smaller than 4 ha. Based on the 83,115 named lakes, we found that lake names reflect peoples’ everyday lives, that lakes can inspire creativity (although the most common lake name is “Mud”), that Native American and indigenous languages have played a role in lake naming, and that there are regional differences in lake names. Unfortunately, we also found that derogatory terms were part of some lake names. We advocate for thoughtful and inclusive official naming of the 400,000 unnamed lakes in the U.S., as well as renaming of the lakes with derogatory terms to help focus attention on the importance of lakes to local communities and nations.

What do we know about lake names and how do we know it?

“What’s in a name? That which we call a rose, by any other name would smell as sweet.”
— William Shakespeare

Few will argue that people are drawn to bodies of water, often relying on them for fresh drinking water and food, and seeking them out for relaxation and fun. In fact, research shows that our brains may be hard-wired to react positively to water and that when we are near water, it can help calm us and increase our insight (Nichols 2014). Case in point—how many people spent part of their summer holiday this past year on a lake? Given this importance of water to people, one may think that careful thought has been put into the names of waterbodies, and that those names reflect societal values.

But, does this assumption hold water? In this article, we examine what people choose to call individual lakes to examine the relationships between people and water. We analyzed the official names of lakes in the conterminous United States as part of a broader initiative, called LAGOS-US, to study lakes within the 48 conterminous states. Here, we describe the terms people use to refer to “lakes,” the names they attach to individual lakes, and what appears to motivate their lake naming. We define lakes following Soranno et al. (2015) as: “A perennial body of relatively still water. We include lakes and reservoirs that range from being completely natural to highly modified... we exclude sewage treatment ponds, aquaculture ponds, or other such detention ponds that are known to contain basins that are entirely artificial and were built for high-intensity human use.” We accessed the official lake names of the 479,950 inland lakes ≥ 1 ha in the conterminous U.S. from the National Hydrography Dataset that is publicly available (U.S. Geological Survey 2018). Within this data set are the official lake names from the U.S. Geographic Names Information System (hereafter referred to as GNIS) that is maintained by the U.S. Board on Geographic Names (BGN) Domestic Names Committee (U.S. Board on Geographic Names Domestic Names Committee 2016). The naming of all natural geographic features in the U.S. is maintained by this committee, and the resulting database includes all official names in current use.

How many lakes are named in the conterminous U.S.?
A remarkable result from our analysis of almost a half a million lakes is that 83% of them have no officially recognized name (Fig. 1). The 83,115 lakes with names are more likely to be larger than small (Fig. 1); by lake area size class, lakes ≥ 50 ha in surface area are much more likely to be named (78%) than those < 4 ha in surface area (8%). There are also strong regional patterns in the probability of lakes being named. For example, the lake-rich Northeast and Midwestern states along with those in the Western U.S. have a high probability of named lakes (see Fig. 5 for region names, state composition, and borders). In contrast, the Central Plains and Southeast U.S. regions have very low proportions of named lakes. Some of these regional patterns may be linked with
the high frequency of small lakes in regions with a lower proportion of named lakes (Fig. 1, inset). The fact that smaller lakes were not given official GNIS names suggests that people may value or use larger lakes more than smaller lakes. However, it is also possible that many of these small unnamed lakes have a local, unregistered name, and are still highly valued and used.

What other terms are commonly used for a “lake”?

A recent study that looked at whether lake names in the U.S. began or ended with “Lake” (Beisner and Carey 2016) found regional differences in the ways lake names are constructed and suggested these differences were likely a result of settlement patterns of European colonists and their naming conventions. But, lakes are not only referred to as lakes—they are also called ponds, reservoirs, or impoundments, to name a few. For the officially named lakes, we found that 69% have “lake” in their name. However, named lakes are also referred to as “pond” (16%), “reservoir” (11%), and “tank” or “slough” or “millpond” (each at 0.5%). Larger lakes appear to be more likely to be called “lake” or “reservoir.” Hereafter, we refer to all of these as lakes.

We also found strong regional differences in what people name lakes (Fig. 2). For example, a common question asked of limnologists is “What is the difference between a lake and a pond?” Conventional wisdom is that the term “pond” refers to smaller lakes. However, our results shed additional light on this issue. In the Northeast, a lake is termed a “pond” in much higher frequency compared to the Midwest U.S. region (Fig. 2). In fact, the term “pond” shows up as dominant in the northeastern U.S. and commonly occurs all the way down the east coast, which was initially settled by European colonists. Ponds are generally larger in the Northeast than the Midwest (Fig. 3), suggesting that settlers in the Midwest tended to use the term “pond” for smaller lakes, whereas settlers in the Northeast did not. These regional differences in terminology help to explain why such terms often confuse the public when trying to locate lakes and understand lake names, and why there are not yet scientific criteria differentiating lakes, ponds, reservoirs, and other terms that are used to refer to lakes in the U.S. and elsewhere.

Some of the observed regional differences in lake terms may be related to colonist settler patterns as found by Beisner and Carey (2016), to Native American ties with their ancestral homelands, or may reflect the different geophysical settings and lake types across the U.S. For example, there are far fewer natural lakes west of the Mississippi River, so it is not surprising that the term “reservoir” is more common in those areas. It is also common practice in Arizona and surrounding states to put earthen dams on ephemeral streams to pool water and create an impoundment called a “tank.” Some rarer terms, such as “slough” and “impoundment,” are also quite localized. For example, sloughs are present in South Central U.S., but are rare elsewhere.

What are the most common lake names?

The most common full name of a U.S. lake is “Mud” (Fig. 4). In fact, there are 897 lakes named “Mud,” including 677 Mud Lakes, 210 Mud Ponds, 4 Mud Reservoirs, 3 Mud Sloughs, 2 Mud Tanks, and 1 Mud Millpond. The next most common lake names are: “Long” (605 lakes), “Twin” (400), “Horseshoe” (385), and “Round” (384) (Fig. 4).

Although these most common lake names are widespread throughout the conterminous U.S., there are also notable regional differences (Fig. 5). Following the dominance of Mud in the Midwest and Northeast U.S., the most common lake names in other U.S. regions were Goose, Silver, Lost, Twin, Horseshoe, Long, and Lost. Although not always the top regional name, “Mud” was in the top 25 names for all regions with lowest ranks in the Central Plains and the Southeast compared to other regions where it was always in the top five. The most common surnames used for lakes across the entire data set were “Johnson” and “Smith,” which were also very common in the Southeast and South Central U.S., respectively (Fig. 5). We also found that the names of 559 Texas
reservoirs started with the term "Soil Conservation Service." "Mill" lakes or ponds were found in the top 25 names only in the Northeast and Mid-Atlantic U.S., suggesting their early use for supplying water to watermills. "Rice" was found in the Midwest region, perhaps referring to the native wild rice that grows in lakes and is harvested by Native Americans of that region. "Cranberry" showed up in names of the Midwest and Northeastern states, but not other regions, perhaps signifying the harvesting of cranberries in these regions of the U.S. Words such as "Crater" and "Summit" were far more common in the Rocky Mountains/Northern Plains and Southwest regions (Fig. 5), reflecting the mountain ranges present in these regions. Finally, "Alkali" was present in the Central Plains and Rocky Mountains/Northern Plains, suggesting an influence of the more arid climate on lake names.

What do lake names reflect?

"A lake is the landscape’s most beautiful and expressive feature. It is earth’s eye; looking into which the beholder measures the depth for his own nature.”

— Henry David Thoreau

Lakes have long been inspirations for artists and poets. Therefore, one might expect lakes to be named in ways that evoke feelings of being drawn to water and being bestilled by its beauty (Nichols 2014). We explored the range of names and namesakes, first seeking examples of lakes with unique, unusually creative, or unusually long names (Table 1). The longest lake names by characters (63) and words (9) are both in Montana and the two lakes with the single longest word are in Maine and Massachusetts, respectively (Chemquasabamticook in Maine and Chaubunagungamaug in Massachusetts). However, many lakes have simple names such as Lake A, Lake Z, or Reservoir 1 (Table 1). We also found examples of lakes named after countries and religions, as well as lake names that appear to be the result of notorious incidents or people that conjure comical imagery (e.g., Blow-me-down Pond, Whoopie Cat Lake, and Beermug Lake; Table 1).

To examine potential motivations behind lake names, we examined the proportion of lake names that included selected terms related to lake features such as shapes or colors; biota associated with lakes such as mammals and birds; the most common first names of men and women during the past
century; names connected to indigenous languages; and miscellaneous words reflecting emotions, drinks, the afterlife, and derogatory terms (Fig. 6). After Mud (omitted from this analysis), lake names are most likely to contain words descriptive of lake features such as shapes (4133), colors (1483), and appearance (1351) followed by lake-associated biota grouped into mammals (1236), trees (967), birds (917), and fish (742). The most common words in lake names in these descriptive categories were: Little (1673), Bear (438), Clear (378), Black (374), and Pine (346) (Fig. 6).

Although the remaining lake name categories were less common, we highlight some naming patterns related to human-related aspects of lakes. Lake names were commonly based on men’s and women’s first names (e.g., Thomas/Tom and Mary), emotions such as hope and surprise, references to the afterlife (e.g., Sainte/Saint and Paradise), and drinks such as coffee, milk, and whisk(e)y (Fig. 6). We found over 1100 lakes with names that have some connection to Native American languages (Fig. 7). The most common indigenous term is Tamarack (Algonquin; Fig. 7); many state names of indigenous origin (e.g., Connecticut, Oregon) and tribe names are also recognized in lake names. Unfortunately, derogatory terms were also represented in U.S. lake names, with the words Squaw, Injun, or Redskin in the GNIS database a total of 44 times (Table 1 and Fig. 6; see next section for details).

We cannot truly know the reasons behind any given lake name. However, studying the 83,115 named lakes in the conterminous U.S. gives us a window into people’s relationships with lakes. The names suggest that lakes are part of peoples’ everyday lives, that they can inspire creativity (although not always, since there are 897 Mud lakes), that there are regional differences in lake names, that they are associated with Native Americans and indigenous languages, and that the smallest lakes are less likely to be named. However, official names of lakes (and any geographic feature) should be held to standards that reflect society’s values and that are inclusive of all people.

How do societal norms influence lake names?

“I read in a book once that a rose by any other name would smell as sweet, but I’ve never been able to believe it. I don’t believe a rose WOULD be as nice if it was called a thistle or a skunk cabbage.”

—L.M. Montgomery

Who has the right to name a lake, and what are acceptable lake names? Because societal norms change through time, what once was thought to be appropriate for a
Lake name may be inappropriate, offensive, or derogatory today. In fact, some lake names provide evidence of the U.S. history of unjust and exclusionary practices and policies on the basis of individual or group identity (Brown et al. 2015). Lake names that contain derogatory terms, reference injustices, or honor those who committed injustices suggest that people of certain identities are unwelcome or that the actions taken against them were justified. The USGS BGN has provisions for these situations and requires that lake names not be offensive to a particular racial or ethnic group, gender, or religious group. In fact, there are two reasons for established names to be changed: to bring into agreement with well-established local usage and to eliminate problems involving names asserted to be offensive, duplicate, or those established on the basis of incorrect information (U.S. Board on Geographic Names Domestic Names Committee 2016).

Despite these provisions, there are a concerning number of U.S. lake names that include derogatory words (Table 1 and Fig. 6) such as “squaw,” a term considered

**TABLE 1.** Examples of lake names by category from the U.S. GNIS database with the state that they are located within in parentheses. When a state is not indicated, the name is found in multiple states.

| Lake name category | Lake name(s) |
|--------------------|--------------|
| Longest by total characters | Clarence Cannon Memorial Watershed Structure Number 1 Reservoir (MT) |
| Longest by single word | Chemquasabamticook (ME); Chaubunagungamaug (MA) |
| Longest by words | Little Siri-A-Bar Watershed Structure Number 1–5 Dam (MT) |
| Most words without hyphens | Sandy Creek O Trail Creek Reservoir Number Two (GA) |
| Examples with 1-letter (or number) | Lake T; A, B, C, D, G, H, J, L, S, T, U, V, Y, and Z Lakes; Reservoir 1; Pond L* |
| Examples with complicated numbers | 0.985 Reservoir (WI); 88A Tank (AZ); 6 Lakes Estates Lake Number 5 (TX) |
| Examples of religions | Catholic; Baptist; Mormon |
| Examples of connections with Native Americans | Kiowa; Cherokee; Moccasin; Texas; Winona; Nokomis |
| Examples of countries | French; German; Spain; Denmark; Sweden |
| Examples of derogatory words | Gypsy; Jew; Negro; Squaw; Injun; Redskin; Chinaman; Okie; Dago |
| Examples of notorious events, people, places, or incidents | Nast E Lake (CO); Nasty Pond (GA, OR); Stingy Lake (MN); Stinking Water Pond (OR); Stinking Lake (MN, NM, OR, WA); Greasy Jim Lake (MI); Hell for Sure Lake (CA); Hell Roaring Lake (ID, MT); Hell Hole Lake (or Reservoir) (UT, CA, NM); Joe Phegleg (MO); Mistake Lake (WY); Devils Washdish (NY); King and Queen Courthouse Pond (VA); Drunken Charlie Lake (WA); Froze-to-Death Lake (MT); Big Bad Luck Pond (NH); Hole in the Wall Lake (AR) |
| Examples that elicit a smile | Blow-me-down Pond (NH); Too Lazy to Farm Lake (TN); Lake Run-A-Muck (TX); Ace-in-the-Hole Lake (WI); Little Last Chance Lake (CA); Little Too Much Lake (MN); Good Luck Lake (NY); Whoopie Cat Lake (IL); The Angels Bathing Pool (MT); Bigfoot Lake (ID); Lake Kittyprince (WA); Lake of the Fallen Moon (CA); Coffee Creek Cow Camp Lake (TX); Lake Full of Fish (MN); Beermug Lake (SD) |

**FIG. 6.** Pie charts showing the proportion of key words included in lakes names according to four categories: lake features, organisms, first names, and miscellaneous. Numbers within pie slices are the total number of lakes containing that key word in the U.S. GNIS database. Prior to analysis, the lake designation (i.e., lake, pond, reservoir) was removed from the name and “Mud” was excluded as a keyword.
offensive to women, especially Native American women. However, some of these situations are being rectified. For example, a bay within Lake Monona, Wisconsin that is part of occupied Native American ancestral land has been recently renamed from “Squaw Bay” to “Wicawak Bay” (Vinick 2019). This change both removed an offensive lake name and reaffirmed the lake’s importance for the ancestral lands of the Ho-Chunk Nation by using the word for muskrat in the Ho-Chunk language.

Another renaming event demonstrates the significance of lake names as a venue for reflecting cultural power, leveraging the relationships between people and places to enshrine societal values embodied by the name-sake. The Minnesota Department of Natural Resources recently approved the restoration of the indigenous (Dakota) name, Bde Maka Ska, to Minneapolis’ largest and most popular lake, previously named Lake Calhoun. At present, the agency’s legal authority to do so is being challenged in state courts (Otárola 2019). This conflict is invigorated not by Minnesotans’ love of law, but by their love of lakes. Opponents feel protective of their own connection to a lake and the name they grew up with, while renaming proponents want to use that affinity as a catalyst of cultural healing, by acknowledging peoples historically displaced from the region (in no small part due to policies constructed by U.S. Vice President John Calhoun who was also a defender of slavery in the U.S.).

Lakes are not alone in their naming troubles. Racial slurs, for example, are included in the official names of over 1000 federally recognized geographic features (Brown et al., 2015). Denali, the tallest peak in North America, provides an example of the power of thoughtful and forceful renaming to reframe respect for local, often indigenous names. This mountain was previously officially named “Mount McKinley” after President McKinley, who had no direct connection to the mountain or Alaska. The mountain’s name was officially changed in 2015 by President Obama to reflect its long-held indigenous (Koyukon) name (Korte 2015). There is also an ongoing debate about the name of Mount Evans, Colorado. This feature is named for John Evans, Governor of the Territory of Colorado, who appointed John Chivington in 1864 to lead a local militia that massacred >200 Cheyenne and Arapaho people in the event now known as the Sand Creek Massacre. People who support the name change argue that Evans and that atrocity should no longer be honored, while those who oppose the change argue it will create confusion and be logistically challenging (Kailus 2018). The prevalence of such naming issues across a range of geographic features calls for systematic processes to document and rectify the problems. For lakes, we recommend thoughtful formal naming of currently unnamed lakes, further reflection of how existing names of lakes may offend Native Americans and other marginalized groups, and renaming lakes with offensive, inappropriate, and derogatory names in a way that is inclusive of these groups.

How do you name (or rename) a lake?

We were surprised and disappointed to discover that 83% of lakes in the conterminous U.S. have no official name. From our research perspective of developing the LAGOS-US database, having lakes assigned an official name allows better tracking of continental-scale water quality because it provides useful information for confirming the identity of target lakes on digital maps. Given the increase in digital mapping technologies and apps for individuals to submit georeferenced lake data such as the presence of algal blooms or invasive species, we hope that the proportion of officially named lakes will soon double (or more!). In fact, we urge individuals, communities, municipalities, and other local entities to consider naming nearby lakes that are not officially named.

If you are interested in suggesting a name for an unnamed lake, or suggesting a new name for an existing named lake, submit a formal application to the BGN Domestic Names Committee (the online application is available at https://geonames.usgs.gov/docs/pubs/DGNR_form.pdf). The naming of lakes in the U.S. is maintained by this committee, which has clear guidelines about how they can be named. For example, lakes cannot be named for a person or animal who is alive or who has been deceased for <5 yr; they cannot include a commercial name, be overly long, or duplicate a nearby feature; and they cannot include unusual characters or be offensive to a particular racial/ethnic group, gender, or religion. Individuals and groups wishing to name a lake (or rename one) must submit an application and justification for the name. Requested information includes a proposed name, the exact location of the lake, a description of the lake, a list of
local names currently in use for the lake, the origin of the name including historical significance, biographical data (if it is commemorative of a person), the nature of the usage, whether there is local opposition to the name, and evidence that the feature is unnamed.

We end with a challenge and a question to consider. We challenge each person reading this article to propose to do one of the following actions: name a currently unnamed lake; nominate an existing, but unregistered lake name; or submit an application for renaming a lake that has a derogatory name. In addition, we suggest that you consider other ways to help lakes get official names. Perhaps local communities could hold competitions or lotteries to name unnamed lakes. Just as with human names, lake names can signify a variety of things, including cultural and societal norms and values. So, we ask: Are there lake names that might better reflect today’s values? If you had the opportunity, what would you name a lake, and why?

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Author contributions

The idea for this paper came during the June 2019 Continental Limnology research group annual workshop. K.S.C. and P.A.S. helped to define the research question, coordinated the writing of the paper, and drafted many sections of the paper. K.E.W. helped to define the research question, analyzed the lake names database and created figures, contributed to and reviewed the text. J.D.V. contributed to discussions and writing about the societal norms surrounding lake names and processes for renaming lakes. N.J.S. analyzed and mapped spatial patterns of lakes, defined and completed the indigenous words/names analysis, helped draft the societal norms section, and reviewed the text.

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Editor’s Note: Mental health is an issue that affects us all, but we have not addressed it at ASLO. The L&O Bulletin has provided a platform for the society to address workforce issues and the download statistics for workforce related content indicate a healthy appetite for it among our readers. The many personal responses I received from readers to the “Riding the Work-Life Teeter Totter” article last year inspired me to tackle this very important topic in our pages.

Abstract

Headlines abound with news of the mental health crisis in academia. In this article, best-selling author, speaker, professor, and licensed clinical psychologist Dr. Andrea Bonior discusses some challenges such as imposter syndrome, toxic labs, and the post-tenure slump.

It is no secret that there is a mental health crisis in academia. A quick Google search yields dozens of articles and columns on the topic in the past year alone (Fig. 1). While the topic is finally on the radar and being openly discussed, institutional reform is notoriously slow. Furthermore, the stressors that can make graduate school such a challenging experience vary wildly from one lab to the next, even within the same department at the same institution.

Institutional reform, while absolutely necessary, will not help students suffering now. So what is a graduate student to do? While ideally a graduate student would have sniffed out a toxic lab prior to committing the critical five (or more) years of a Ph.D. program, we all know hindsight is 20/20. Students (or technicians or postdocs) should not feel they must just “grin and bear it” as long as they can, in the name of science. Similarly, a lab does not need to be “toxic” for graduate school to be challenging. It is a stressful time under even the best conditions.

In following the many recent threads on Twitter about mental health struggles, a common theme is the value of psychotherapy. And when I think of psychotherapy, I think of a friend of mine who, as I like to say, literally wrote the book on friendship: Dr. Andrea Bonior. As an academic herself, this is a topic near and dear to her heart and she graciously agreed to answer a few questions about mental health in academia (even for us not-so-young scientists).

Dr. Andrea Bonior (Fig. 2) is a licensed clinical psychologist, speaker, and author who has been affiliated with a university virtually nonstop since setting foot on campus her freshman year at Yale University. She went on to receive her Ph.D. in clinical psychology from American University, including a clinical pre-doctoral internship year at the University of Miami, where she specialized in anxiety disorders and depression. She did her postdoctoral fellowship at George Washington University, and began her teaching career there shortly thereafter. She has served on the adjunct faculty of Georgetown University for the past 13 yr, where she teaches Abnormal Psychology to undergraduates. She spent years seeing students in university counseling centers for therapy, including graduate students, but has now had a private practice outside of Washington, DC, for the past 10 yr. She is best known for her media work, as the long-time voice behind “Baggage Check” for The
I think the first thing for a new student to do is to recognize that these thoughts are normal, that doubts are part of the adjustment, and that imposter syndrome is incredibly common. That alone goes a long way to not listening to those thoughts and letting them sink in to the point where you truly believe you are undeserving of your position. Remember that you often have no idea how someone is feeling internally just by observing them outwardly, and that many of the seeming superstars may be suffering from the same crushing self-doubt, procrastination, or anxiety that you are. This is why developing meaningful relationships with others can be useful—people where you can let go of the façade and be real, and be vulnerable. Maybe it is not necessarily someone in your lab or your cohort, and that is okay. But maybe it is a roommate, or a person in another program, or even an online community of other graduate students. Being sure to nurture yourself outside of your academic work is key—to still try to find time (as hard as it sounds!) for physical movement, fresh air, other hobbies (I know, it sounds unrealistic, but it does not have to be), and other friends. Graduate school can be all-consuming if you let it, and so taking little moments to still try to nurture the parts of yourself that are not just a student can help you reclaim your confidence, and help insulate you against stressful experiences in your program (which are unavoidable.)

**AS:** Something that has gained increasing attention in recent years are “toxic” labs. I’ve read countless posts from young scientists who are recruited to a prestigious lab, only to discover the culture and atmosphere of the lab is toxic (be that from harassment, abuse, questionable ethics, etc.). Much has been written about institutional reforms that could help with this situation, but what advice do you have for graduate students or postdocs who find themselves in such a situation and who feel they must choose between their mental health and their academic future?

**AB:** It can be disheartening. Of course, in my ideal world, there is power in speaking out, and people band together to expose the toxicity of these places. Easy for me to say, I know! In a situation where there truly is no recourse, I do not think the same answer is going to be right for everyone. Some people are going to hold their noses and get through it, and others may choose to leave. For those choosing to stay, there are a few considerations. One is to find an ally. Someone you trust that can help look out for you—perhaps in a reciprocal relationship where you both are doing that. Another is to consider professional support; if you are in a toxic situation, that will have consequences, and it is better to seek out therapy as preventative measure for keeping yourself feeling okay than in an emergency crisis situation (a feeling of helplessness compounds stress, so feeling stuck in a situation makes the bad situation even worse). A third thing to keep in mind is to keep your boundaries intact. Sometimes in toxic situations, we keep taking more and more and more because it is a slippery slope, and before we know it, we are accepting things that 6 months ago would have made us run for the hills. So, be clear with yourself about what you will and will not tolerate, and what would lead to your taking action, walking, speaking out, or having a conversation about it with someone. And finally, keep your eye on the prize and up the self-care. Break down individual goals into small, specific steps and have a clear escape route. Remind yourself of what milestones you need to meet to have more autonomy, step by step.

**AS:** A hashtag that I see a lot on Twitter is #ImposterSyndrome. Do you think the academic environment is particularly conducive to creating this feeling? What are some of the negative consequences of “imposter syndrome” and are there strategies you can recommend to counteract it?

**AB:** I do think that the academic environment is particularly ripe for imposter syndrome, because by its very nature, you are exposed constantly to people who are passionately thinking about ideas around the clock, and sharing those ideas, and so it is a constant barrage of “Wow—look what they’re doing! Why didn’t I come up with that?” And let us be honest, there can also be a lot of posturing; people jockeying for attention by one-upping each other, or poking holes in each other’s work, or trying to establish their dominance by being the “smartest” person in the room. But imposter syndrome can be insidious because it can go from fleeting self-doubt to becoming ingrained in the way you see yourself. And that will affect your behavior—which can become a self-fulfilling prophecy. You will doubt that you have anything of substance to offer, for instance, so you will not speak up at meetings and be less likely to follow up with your ideas or take intellectual risks.
You will believe that you are not worthy of X position or Y conference or Z project and so you will not attempt to pursue them. You will assume that others’ voices are more valid than your own, so you will accept more what other people are saying even when it deserves scrutiny. So the damage is real: you sabotage yourself. Again, I think one of the most important steps is to recognize this voice as an unreliable narrator: to acknowledge it as imposter syndrome. One thing I work with my clients a lot in terms of this is to de-fuse from the thought—separate yourself from it. You do not have to ignore the thought or fight it, but rather you have to simply recognize that it is a distorted, inaccurate voice. So, instead of “I’m the least intelligent person on this panel,” you would say “I’m having the THOUGHT that I’m the least intelligent person on this panel.” It seems hokey, but over time it helps you categorize those thoughts as being part of a skewed lens that you are looking through. And the more you do this, the more automatic it becomes—you no longer sit there and engage with the thoughts for as long, and are far less likely to believe them.

**AS:** Lastly, I want to ask you about mid-career academics. I’ve heard from more than a few colleagues about the “post-tenure slump” (which I’m sure those who are dreaming of tenure will either laugh or roll their eyes at). Is this a real thing or the academic version of a “mid-life crisis”? Any suggestions for our mid- to late-career members about mental health issues they may face?

**AB:** This is absolutely a common problem, and in fact you will see it echoed in other industries: there was a goal that took years of effort to meet, and perhaps subsumed all kinds of emotional energy and threatened to eclipse the person’s life. Everything became focused on that one goal, which probably grew the expectations that once that goal was met, everything would fall into place and be easy and joyous. It is virtually impossible for that not to lead to a letdown, as the new question arises: “Now what?” We call this the myth of arrival, the idea that arriving at a certain point is the holy grail and only then will good things begin. It can be incredibly disorienting to reach that goal, look around, and realize that not only do things not suddenly feel more joyous, but they actually may be more stressful. And most importantly, there comes a question of where to find new challenges and meaning now that what had always been the number one focus is now checked off the list and requires no more attention.

So, the obvious answer is “make new goals!” and indeed that can be satisfying in certain ways, but it also threatens to just perpetuate the problem—if you are only living for your goals, then it is truly difficult to find meaning and true engagement in the present moment before you have reached them. So just adding a new goal as a substitute for tenure is not the whole answer. It is important to find meaning in the here and now. Ask yourself the deeper questions about whether you were expecting to suddenly be a different person once you got tenure, that that would give you self-worth somehow. Are there things missing in you that need to be filled in other ways? Were you attaching too much magical meaning to getting tenure? Feeling aimless can be disorienting, but it also can be a tremendous opportunity to redefine what matters most to you. The more you can attach to a deeper meaning—the “why” behind why you even sought to get tenure in the first place, the more that you can still feel connected to a sense of purpose, even when the biggest goal you have had so far is checked off your list.

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Illuminating a Black Box of the Peer Review System: Demographics, Experiences, and Career Benefits of Associate Editors

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Abstract
Editors are often described as gatekeepers of scientific publishing, as they are responsible for maintaining journal standards, deciding what is published, and ultimately guiding discourse. Scientists who are journal editors gain career benefits, yet these are rarely described to early career researchers, much less how to prepare for such a role. Additionally, disparities at the editorial level could impact which scientists receive benefits of filling these roles. To better characterize the demographics and professional experiences of current associate editors, while also highlighting the benefits and potential challenges to this position, we conducted a survey of associate editors for the Association for the Sciences of Limnology & Oceanography society journals. Our results highlight potential demographic disparities present in the editorial pool, including that non-native English speaking editors assume the role after obtaining more experience serving as a peer reviewer than native English speaking editors. Our results also highlight several rewards along with challenging components of being an editor. We hope our results can inform early career researchers on steps they can take to prepare themselves for editorial work, as well as provide strategies for scientific societies to minimize editorial board disparities.

Introduction
Peer review is foundational to modern scientific publication. Before scientific discoveries are disseminated in academic journals, they must pass through peer review. During this process, not only is the science scrutinized, including the scientific approach, data analysis, interpretation, and validity, but so too is the writing and presentation of the science. As part of peer review, journals have editorial boards that oversee the entire process and are responsible for the fate of submitted manuscripts. Because of the critical role that editorial boards play in deciding what is published, we examined the motivations and characteristics of board members to illuminate an often mysterious element of the peer review system.

Journal editorial boards typically consist of “editors” who serve in one of three main categories of roles. First, an Editor in Chief (EiC), who is typically a broadly trained scientist, is responsible for overseeing the editorial process and policies across the journal, managing other editorial staff, and making the ultimate editorial decisions on published content. Second, a managing editor, who is typically an expert in publishing rather than a scientific field, often oversees the mechanics of manuscript submission, including monitoring the manuscript submission system, checking for formatting issues, and communicating with authors when there are specific issues to be resolved related to submission or, upon acceptance, publication. Finally, associate editors (AEs; also called subject-matter, senior, or handling editors), who are scientists with an established scientific track record, are responsible for selecting manuscript reviewers, evaluating the reviews, making recommendations for or against publication, and sometimes performing reviews themselves. Recommendations are typically passed on to the EiC who then makes the final decision based upon the recommendation of the AE. Because of the crucial role AEs play in the peer review process, they are often labeled as “gatekeepers,” and as such, an invitation to join a journal’s editorial board is considered an important career stepping-stone for many scholars (Haak 2002).

Despite the influence of AEs in publishing, their place in the peer-review system is not always obvious to researchers. This includes both early career researchers (ECRs) who have less experience with publishing, as well as experienced mid-career researchers who lack clarity about the tasks required of AEs (e.g., Saunders 2019), and whether it is something they are interested...
in pursuing in their own careers. This lack of knowledge prevents qualified researchers from making informed decisions about whether or not serving as an AE is something they should take on. When thinking about becoming an AE, scientists may ask themselves: will serving as an AE provide tangible career benefits? What are these benefits and do they outweigh the costs in terms of time that could be used for research, teaching, and writing? Do I want to be viewed as a gatekeeper, potentially alienating teaching, and writing? Do I want to be the person that decides what is published, what is rejected, and even what reviews are performed? And does serving as an AE align with my long-term career goals? Here, we provide a list of pros and cons of serving as an AE to highlight both the benefits and costs for researchers considering the role. Because of the critical role that AEs play (through influencing what is published), we also provide recommendations to editors and societies on ways to improve editorial training and to enhance diversity on their editorial boards.

Methods

We surveyed 103 AEs who were serving on the editorial boards of three ASLO journals as of January 2019: Limnology and Oceanography, Limnology and Oceanography Letters, and Limnology and Oceanography Methods. We asked three types of questions: (1) professional experience/demographics (which included position type, years post Ph.D., number of publications, and number of peer reviews before becoming an AE), (2) personal demographics (which included gender, native language, country of origin, etc.), and (3) perceptions of the most rewarding and challenging aspects of serving as an AE. To ensure confidentiality, we did not ask questions related to research field or country of residence. All questions were optional and the complete survey can be found at https://doi.org/10.6084/m9.figshare.9553121.

We compared the demographics of the AE population to mean ASLO membership data for 2018, which contained information on gender and country of residence. To compare native language of AEs to the broader membership pool, we then categorized each membership country as primarily English or non-English speaking using official language information. Mann–Whitney tests were performed in Graphpad Prism v.8 to determine any statistically significant differences between the distributions of male and female editors and native vs. non-native English speaking AEs. Specifically, we compared distributions of AEs for years post Ph.D., number of authorships, and number of peer reviews.

Results and discussion

Our response rate to the survey was 70% (n = 72). Although we do not suggest that this population represents all AEs across all journals in all fields, this is one of the few surveys to examine motivations of AEs and compare editorial boards of society journals to the membership. Moreover, we also investigated peer review performance as a measure of AEs’ experience with the publication system, while previous studies focused on authorship as the sole measure of productivity (e.g., Metz et al. 2016). Below we describe several themes related to our research questions that emerged from this data set and provide supporting evidence from other studies for our interpretations.

AEs are most often tenure-track faculty at research-focused institutions

The results of our survey revealed that when they first became an AE, 58% of respondents were tenured or in a tenure track position at a research-intensive university, whereas 17% were scientists at research institutions with little to no teaching expectations. A smaller number of AEs identified as tenure track faculty at a teaching-focused institution (7%), non-tenure track faculty at a university (3%), with even smaller numbers working as part of university administration or at non-profit organizations. When asked about their current positions, 67% responded that they are currently tenured/tenure track professors and only 8% are scientists at research institutions. Only 10% of respondents are currently scientists at government agencies. To the best of our knowledge, no studies have investigated the position type of AEs for aquatic science journals, and our results highlight how homogenous the AE pool is in terms of position type.

Some ECRs are AEs

We assessed research experience before becoming an AE, both in terms of years since earning a doctoral degree as well as experience with publishing, and found that many ECRs are AEs. Over half (58%) of respondents reported first becoming an AE within 10 years of earning their doctorate, and quite a few (13%) are still less than 10 years removed from their graduate work (Fig. 1A). This shows that although the majority of ASLO AEs (88%) are currently at least mid-career researchers (>10 years post Ph.D.), ECRs are key components of editorial boards for the society.
Given the representation of ECRs in the AE pool, it is perhaps surprising that a number of respondents explicitly stated that ECRs should not focus on becoming an AE until being more established in their careers (e.g., after receiving tenure). Others noted that while ECRs may have an interest in serving as an AE, these scientists should first consider other time commitments they may have, and not prioritize serving as an AE early on:

> It is a truly rewarding experience, but make sure that it is the best place to spend your time, especially if you are still on the job market or just starting a new post (pre-tenure).

Conversely, similar numbers of AEs enthusiastically encouraged ECRs to work toward becoming AEs by actively seeking peer review opportunities. Many also noted that networking and communicating their interest in reviewing and editing to current journal editors would go a long way to ensure that ECRs get opportunities to review manuscripts:

> Get lots of experience as a reviewer. Step up and let editors know you are available to review submissions. Be pro-active.

Together, these results indicate that although ECRs may not be traditionally viewed as appropriate AE candidates, early career AEs are not uncommon. Notably, several societies and society journals have recognized the unique perspectives of ECRs, and seek to develop their editorial talents through ECR advisory boards (e.g., American Institute of Physics APL Photonics Early Career Editorial Advisory Board) and various editorial mentoring programs (e.g., ASLO’s Raelyn Cole Editorial Fellowship and American Society of Plant Biologists Assistant Features Editor program). However, these types of initiatives remain rare.

AEs have substantial authorship and reviewing experience, regardless of career stage

The vast majority of AEs (83%) had co-authored >20 papers by the time they had started as an AE for any journal (Fig. 1B). A robust publication record is not the only thing characteristic of AEs. Many respondents (44%) served as a peer reviewer >50 times before becoming an AE, while 38% had performed 21–50 peer reviews (Fig. 1C). Notably, this work was also distributed across multiple journals as the vast majority of AEs (99%) served as a peer reviewer for more than six different journals, and 19% had served as a reviewer for >20 different journals. The majority of AEs (71%) had reviewed for the journal in which they began their AE career fewer than 10 times, suggesting that extensive peer reviewing experience for multiple journals, and not just a select few, may be essential to be recognized as a potential future AE. This is not surprising, given the networking approach traditionally used to build many editorial boards.

Gender and geographic diversity of ASLO AEs mirror the society

Despite reported gender disparities in scientific publishing, ASLO AE pools are approaching proportional gender representation: 46% of ASLO members are women compared to 42% of survey respondents (Fig. 2A). Generally, editorial boards of academic journals do not display such gender parity (e.g., Dickersin et al. 1998; Cho et al. 2014; Metz et al. 2016). Helmer et al. (2017) reported a maximum of 35% female editorial composition in the Frontiers journal group (across all disciplines), while another study reported that for 10 different environmental biology and natural resource management journals only ~15% of editors were women (Cho et al. 2014). Among a subset of ecology journals, the proportion of female AEs has risen substantially in recent years, with current representation between 21% and 35%, depending upon the journal (Fox et al. 2019). Because there is some evidence that women may be less likely to accept an invitation to become an AE (Fox et al. 2019), the representation of female editors in our survey is even more striking.

While some journals strive to select AEs with the variety of expertise that is reflective of the society’s scientific disciplines, they should also consider whether their editorial boards display broad geographic diversity (Feldman 2008). We found that 60% of AEs were originally from North America, 30% were from Europe, and only 10% of respondents are originally from Asia, Central/South America, the Middle East, and Oceania combined (note that our survey did not assess the current geographic location of AEs). In 2018, ASLO members represented 65 countries, with the majority (70%) from North America, 17% from Europe, and 14% from Asia, Central/South America, the Middle East, and Oceania. Thus, the current ASLO editorial boards overall appear to have similar representation as the society, particularly given that our sample size is relatively small. We also examined membership based on primary language: ASLO members affiliated with English speaking nations account for 72% of our members, which is similar to the proportion of AEs who indicated that English was their primary language (Fig. 2B).
reported, with five individuals not reporting), we note several striking observations within our small sample size. Specially, males were more likely than females to become an AE earlier in their career (Fig. 3A) such that over three times as many male editors started within only 5 years of earning their Ph.D. compared to female editors (18%; \( n = 7 \) vs. 7%; \( n = 2 \), respectively). However, more females became editors between 5 and 10 years post Ph.D., meaning that, overall, similar proportions of men and women editors began as ECRs (63% of male AEs vs. 60% of female AEs; Fig. 2A).

No statistically significant differences were observed between males and females in terms of their authorship (\( p = 0.15 \)) and peer review experiences (\( p = 0.54 \)) overall, but there were notable differences in the distributions worth discussing. For instance, when starting as an AE, 73% (\( n = 27 \)) of male respondents had published between 21 and 50 papers whereas only 64% (\( n = 18 \)) of females had published to that degree (Fig. 3B). In addition, more female than male AEs had <20 publications when they became an AE (25% and 11%, respectively). We noted similar trends with regards to peer reviewing: a larger proportion of females than males served as a reviewer <20 times when starting as an AE (24% and 13%, respectively; Fig. 3C) Conversely, most male respondents have served as a reviewer >20 times before becoming an AE. Whether or not these female editors have published less than their male counterparts over the course of their entire careers is unknown, but our results mirror similar studies demonstrating that women publish less (Larivière et al. 2013; West et al. 2013; Bendels et al. 2018; references in Cho et al. 2014), and that women are asked to serve as peer reviewers less often than men (Lerback and Hanson 2017), possibly due to homophilic tendencies of editors (Helmer et al. 2017, Fox et al. 2019).

Native language disparities exist in AE peer review experience

We also examined native language to investigate the impacts of geography and identity on editorial board composition. We found no clear differences between when native English speakers (70% of AE responses) and non-native English speakers became AEs (\( p = 0.95 \)), despite a small number of non-native English speaking AEs who began the role much later in their careers (Fig. 4A). There were also no significant differences between English speaking and non-native English speaking AEs and their publication record (\( p = 0.18 \); Fig. 4B) although no non-native English speaking AEs assumed the role with fewer than 10 publications. This is in contrast to a small number of native English speaking AEs who began with fewer than 10 publications (Fig. 4B).

Native and non-native English speaking AEs did significantly differ in the number of peer reviews performed before becoming an AE (\( p = 0.007 \)). Seventy percent of non-native English speaking AEs performed >50 peer reviews before becoming an AE, whereas only 32% of native English speakers had the same experience beforehand (Fig. 4C). Only native English speaking AEs performed fewer than 10 peer reviews before starting an AE role.

In addition to established gender disparities in editorial board representation, other studies have shown that geographic disparities exist on editorial boards (which we also considered by asking AEs about their country of origin, see above). For instance, among ecology journals, the representation of scientists from low human development index (HDI) countries on editorial boards is an order of magnitude less than the representation of such scientists as authors in those same journals (Livingston et al. 2016). Despite growing scientific output by researchers from low HDI countries, the diversity (calculated as an inverse Simpson diversity index) of editorial boards among 24 environmental biology journals has remained consistent since the 1980s, with indices ranging from 3 to 5 (Espin et al. 2017). This is in part with results from our survey, which yielded a diversity index of 3.7 for ASLO journals. Improving geographic representation on editorial boards may also ensure that the science published is relevant to researchers beyond North America and Europe (Livingston et al. 2016; Espin et al. 2017). Because some regions, such as Central/South America and Eastern Europe, also display greater gender parity in authorships (Larivière et al. 2013), better inclusion of these regions in editorial boards may also naturally lead to future improved gender parity.

Being an AE is challenging, but rewarding, work

Serving as an AE is generally recognized as beneficial to researchers, most notably through increased visibility and prestige (Haak 2002), which might be especially important for the 70% of ASLO AEs who are tenure-track scientists. However, no respondents of our survey described "prestige" as a benefit of being an AE (Table 1). Rather, our survey revealed additional, intangible benefits of serving as an AE that are missing from this standard portrayal of editorship as a career "stepping stone" (Haak 2002, Fox et al. 2019). When asked to describe what they have learned or gained the most as an AE, two clear themes emerged: serving as an AE provides...

![Image](73x558 to 357x719)

**FIG. 2.** ASLO society membership data compared to AE demographics. (A) Percentage of male and female scientists as part of ASLO (black bars) and AEs (gray bars), (B) percentage of ASLO members and AEs affiliated with native English speaking countries and non-native English speaking countries.
TABLE 1. Rewards and challenges of serving as an AE

| Rewards                                      | Challenges                                  |
|----------------------------------------------|---------------------------------------------|
| Better understanding of publication system   | Locating qualified peer reviewers           |
| Improved communication skills                 | Making difficult decisions on submissions   |
| Greater perspective of science                | Potentially heavy, unpredictable workload    |
| Staying current in your discipline            | Synthesizing conflicting peer reviews        |
| Serving the greater scientific community      |                                             |

(1) greater perspective on the publishing system \((n = 27)\), and (2) it improves communication skills \((n = 21)\), particularly when it comes to crafting manuscripts and framing scientific arguments. Others responded that being an AE has allowed them to gain broader, more holistic views of science \((n = 12)\), likely as a result of encountering work in subdisciplines to which they may not be normally exposed. The fact that a variety of benefits were mentioned showcases the different ways AEs value this role beyond the prestige it confers.

We also asked AEs about the most challenging aspects of the job. There seemed to be less variety in the kinds of challenges that were described in comparison to their descriptions of the potential benefits (Table 1). Finding qualified reviewers was the most frequently reported challenge for AEs \((n = 31)\), with other common challenges dealing with conflicting or ambiguous peer reviews \((n = 15)\) and juggling the workload \((n = 14)\). Editors also noted challenges related to the detection of ethical issues \((n = 1)\), as well as maintaining rigor while also being sensitive to issues surrounding diversity and inclusion \((n = 1)\). When we assessed peer review requests for manuscripts submitted to Limnology and Oceanography: Letters between 2016 and 2019, we found that the median number per submitted manuscript was 5, with a maximum of 19 separate requests to review. Indeed, the frequency of reviewers denying peer review requests appears to be increasing at ecology journals (Fox et al. 2017), although the reasons for this remain unclear. Clearly, locating reviewers who are willing to perform the task is a substantial editorial challenge.

**Recommendations**

When we conceived of this survey, our plan was to develop recommendations for how ECRs can better prepare themselves to be AEs. Developing this list became challenging as we viewed the data through the lenses of gender and native language, since these aspects of identity appear linked to the opportunities afforded current AEs. Therefore, in addition to ECR recommendations, we also created recommendations for editors as well as publishers and scientific societies. Recommendations geared toward ECRs focus on steps they can take to increase their experience in publishing and/or editorial training (Box 1), whereas recommendations toward editors and publishers/societies include strategies to address disparities on editorial boards, or to set aspirational goals to include scientists from countries and regions that are not currently represented in the professional society and journal pages. We also include steps editors and publishers

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**Figure 3**. Research and publishing experiences of AEs by gender. Black bars represent male AEs \((n = 38)\) while gray bars represent female AEs \((n = 28)\). (A) Years post Ph.D. at which respondent became an AE, (B) number of publications before serving as an AE, and (C) the number of peer reviews performed by AEs before appointment to an editorial board.

**Figure 4**. Research and publishing experiences of AEs by native language. Black bars represent native English speaking editors \((n = 47)\) while gray bars represent non-native speakers of English \((n = 20)\). (A) Years post Ph.D. at which respondent became an AE, (B) number of publications before serving as an AE, and (C) the number of peer reviews performed by AEs before appointment to an editorial board.

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**Box 1** Recommendations for early career researchers

Serving as an AE can be very rewarding, and beneficial to your professional development. In order to best position yourself for this role, we recommend the following:

- Stay active in scientific publishing, as both an author and a peer reviewer. Prioritize publishing your own work regularly.
- Peer review often, and for many different journals.
- Network and communicate with AEs about your interest in peer reviewing and serving as an AE in the future.
- Join a database of peer reviewers; inform your PI or advisor about your interest in peer reviewing.
- Make your research area and contact information widely known; that is, fill in your author information on journal websites.
Editors, publishers, and societies

To better prepare researchers for future roles as AEs, current editors, scientific societies, and publishers should consider developing roles for ECRs to be integrated into the publishing system early in their careers (Boxes 2 and 3). These may include adding ECRs to editorial boards, creating ECR deputy editor positions, or initiating editorial internships/fellowships. These programs would not only better prepare ECRs for a future editorial role, but also allow scientists with a genuine interest in being an editor to self-select for the role early in their career. EiCs should also consider geographic distribution and gender of scientists when it comes to AE selection, with a specific focus on building the editorial board to meet a range of broader goals. In some cases, these goals may be mutually exclusive and can change over time. For instance, societies could work toward making sure that editorial board diversity reflects the professional society membership or the broader scientific population. Societies could also seek out potential editors that are from countries currently underserved by their society (or science as a whole) to grow journal submissions from these regions. Editors can also use other mechanisms to foster an environment that attracts and retains underrepresented individuals by: (1) inviting women and scientists from low HDI countries to be peer reviewers, (2) soliciting reviews and prospective pieces from these researchers, and (3) reaching out to ECRs in particularly via social media, their scientific society, and their own professional networks in the search for peer reviewers. Editors, scientific societies, and publishers should also take steps to increase the transparency of AE selection, so that a broader pool of researchers can apply and be considered for the role.

Conclusions

Our survey captured the perspectives of AEs serving ASLO journals and several conclusions about AE diversity can be drawn from this unique data set. First, research experiences of AEs vary with gender, with men appearing to become AEs earlier in their career than women. Second, scientists from non-English speaking countries become AEs after obtaining more reviewing experience than their native English-speaking counterparts. Our survey also reveals that there are a myriad of benefits to being an AE, yet there may be practices currently in place that limit which scientists can obtain them. Thus, maximizing AE diversity will likely be an important part of efforts to decrease disparities in the peer review system while also allowing journals to leverage the skills and expertise of their entire scientific community. Despite the disparities noted here and elsewhere, ASLO editorial boards are composed of scientists from a variety of geographic and professional backgrounds and are largely representative of the gender composition of the society’s membership. We hope that editors (EiCs and current AEs) can use this information as well as our recommendations to make educated decisions about how to build editorial boards to limit such disparities.

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IS IT TIME TO CONSIDER RUNNING FOR OFFICE?

Lesley K. Smith

“I’m really glad you were elected as CU Regent. We need more of us running for office across the country.” This comment by a well-respected upper level administrator at the University of Colorado in the STEM field took me by surprise. But then, a few weeks later, a professor from the Engineering School asked how I made the jump from academia to politics, and a postdoc at the Medical campus caught me at a board meeting and told me she is trying to start a group that bridges medical research and policy. I had been thinking of writing a piece on running for office of of the population may not understand how we scientists go about our research, there is a silver lining. The Pew Research Center’s report, Trust and Mistrust in Americans’ Views of Scientific Experts (https://www.pewresearch.org/science/2019/08/02/trust-and-mistrust-in-americans-vies-of-scientific-experts/, accessed 18 December 2019), shows 86% of Americans have a “fair amount” of confidence in scientists to act in the public interest (opinions on how to engage in this space differ by party affiliation). Additionally, public confidence in scientists exceeds confidence in the media, business leaders, and elected leaders.

At this point, let me step back and explain how I decided to run for a statewide office. I had been a research scientist at CU for nearly 30 yr, but I was not a political novice. I twice ran and won two terms to my local school board. In that role, I got to know the elected officials spanning from my local city council to our state Legislative delegation for the school district. I served as the Legislative liaison for our board, worked with our lobbyists on bills that impacted our district, and occasionally testified on a particular bill. I was known for delving into the data and asking penetrating questions. One of my colleagues found it fascinating to watch the way I tackled a problem—she said it was like I peeled back the layers of an onion, one layer at a time, with each question I asked. As scientists, this is what we are trained to do, isn’t it? I was respectful of my board colleagues and staff, and they appreciated my fact-based decision-making process. During my tenure on the board, I was asked frequently if I would consider running for city council or planning board and always responded no because education was my passion. The position of CU Regent was the only other elected position I would consider because I believed strongly in the mission of CU as the state’s flagship university for education and research (see Fig. 2). I had planned to retire from CU in 2020

FIG. 1. Lesley being sworn in as CU Regent at-Large by the Chief Justice of the Colorado Supreme Court.
to run in my Congressional District, but I was asked to consider running in the open state-wide seat in 2018. I consulted with my family, as well as with two friends who had run previously for statewide positions. I asked if I was crazy to do this, and they all enthusiastically exclaimed there was nobody better qualified to run for Regent. With that stamp of approval, I jumped in with both feet and went on a wild year-long ride of a partisan political campaign.

Do I regret retiring from academia and becoming a Regent? Not for a moment because I, along with my fellow Board members, make important impacts on CU and, in turn, on our state. CU is the third largest employer in Colorado, educates roughly 67,000 students, contributes $12.5B to the economy and brings in $1.2B in research funding on an annual basis. It is an economic and educational driver in Colorado.

Academics are lifelong learners, and I continue to learn each day I am on the job. As the only scientist on the Board, I am appreciated by both my Board and the voters for my data-driven, analytical approach. I sometimes have opportunities to leverage my environmental knowledge into our work. Currently, I am working in a bipartisan manner to develop a system-wide sustainability initiative, and I have strong support from the new President, students, faculty, and staff. We will be kicking this off on the 50th anniversary of Earth Day through the President’s Sustainable Solutions Showcase, a student-centered competition of innovative solutions for each campus. I am also a resource for our Legislators. A State Representative recently asked about the K-12 science standards, and if I thought there is a need to include more climate change topics. There are many ways that my scientific background come to bear in my role as Regent.

For those who might consider running for office I offer some advice. First, identify your passion and develop a plan of how you can achieve the position you desire. Be realistic—it is difficult to go from 0 to 60 mph. For example, I know of an early-career scientist running for U.S. Senate as their first public office. Your plan should include building your resume to be considered a credible candidate. This can include serving on ASLO committees; Society officer positions, or local city or county boards; getting involved in local politics; or volunteering on a campaign, to name a few examples. There are several scientific organizations, such as ASLO and AAAS, that offer policy-related fellowships, which is an excellent way to test the waters. Finally, there are organizations that offer trainings. 314 Action is specific to scientists, while Emily’s List and VoteRunLead are geared toward women.

Does it make sense for us to seriously consider running for office? I think so. I believe it is critical that we have a seat at the table, rather than to just serve in an advisory role, when policy is being formulated, debated, and voted upon. When asked by my former colleagues, what is it like to be on the Board of Regents, I reply, “It’s interesting, it’s fun, and it’s frustrating.” Doesn’t this explain the research enterprise? Working on policy is messy, like research. I propose that we have the skills to take on this challenge. We are inquisitive, we strive to use data to reach our conclusions, and we are trusted. As elected officials, we can and must make critical impacts on policies related to science and the environment.

ENDNOTE
1. The University of Colorado was founded, along with the state, in 1876 as the flagship institution of higher education. The Board of Regents is Constitutionally mandated to number nine seats and to be an elected body (Colorado is one of four states with an elected board of higher education). The Board is partisan with one representative from each of Colorado’s seven Congressional Districts, and two at-large representatives elected on a statewide basis. The CU system has four campuses.

Lesley K. Smith, University of Colorado, CO; lesley.smith@cu.edu
MESSAGE FROM THE PRESIDENT
Scientific Overhead

Michael L. Pace

I am sitting in a grocery store eating area on a weekday. This is not normal for me but I need to kill some time before picking up a family member. It is remarkably peaceful. No one is here. I have a cup of coffee and an interlude to think and write a few words. I do not need to pay any scientific overhead—at least not for the next 30 min.

Scientific overhead—what is that? It is all the other things we do in our work-lives beside science. My contention here is that scientific overhead has gotten too high. It is robbing us of time to think, measure, observe, experiment, analyze, collaborate, propose, and write. Instead, we are responding to endless demands to do more of this and more of that. Consider the following scenario, you carefully spend a few minutes writing an email message that is related to your department, colleagues, students, etc. You click “send” feeling momentary accomplishment until you note five more emails have come in—ack! This is not just whining by an overly busy scientific society president. Scientific overhead is affecting students and early career researchers impinging on their time and accomplishments. Scientific overhead limits mid-career and senior scientists often to a permanently debilitating administrative state.

Graduate students are by definition busy people. They have courses to take, research tasks, and often teaching duties. More and more they are obligated to conduct outreach, undergo professional training, review papers, mentor undergraduates, and fund their research. All of these activities can be positive, rewarding, and promote growth. Collectively, they can be too much. When do we go over the line in our expectations of students? We should err on the side of protecting early career researchers from excessive duties.

More established scientists experience all of the above demands and additional ones related to their leadership positions and the need to support the scientific community enterprise. Most will tell you that many duties seriously crowd their research time.

I have to confess that ASLO contributes to scientific overhead. We have many activities that are voluntarily carried forth by members requiring their time and effort. Obvious examples are journal associate editors who conduct the review process and in so doing contribute hugely to ASLO. This form of scientific overhead also benefits the scientist. We gain from reviewing and editing. Similarly, we gain from other forms of scientific overhead through exposure to the research of others, through interactions, and through leadership opportunities. I like to think ASLO activities fall on the positive side of scientific overhead. This works if ASLO stays true to its core mission to serve the aquatic scientific community principally through publication and meetings. We must tailor ASLO to benefitting science, always keeping that goal in mind.

Our institutions and funding organizations are easy targets of complaint about runaway scientific overhead. Rather than rail against this machine, let me point you to the novel Moo written in 1995 by Jane Smiley. Moo is set in a university in the Midwestern U.S. with many characters that an inhabitant of academic institutions will recognize. The book is LOL funny and great therapy for those suffering excessive scientific overhead. The central metaphor of the book is Earl Butz—an enormous pig who is feed by a sympathetic and caring undergraduate. Earl’s only purpose is to get larger and larger, but even Earl, in his enormous porcine state wants to be free. To learn the rest you will have to read the book. The implications relative to scientific overhead are clear. Feeding an ever enlarging enterprise cannot be (should not be?) the purpose of an institution—especially a university.

I am not saying scientists should reduce or discontinue public outreach, education, mentoring, scientific service, and many other worthwhile activities. I mentioned above the positive aspects of scientific overhead in the context of serving ASLO. I am saying these efforts must be in balance with the serious demands of research. These activities must be in balance with one’s career stage. I am also saying that administrative loads, which affect time for research, education, and service, are too high.

How can we better manage scientific overhead? We can start by carefully examining the things that we are doing individually and collectively. We should support individual choice in terms of where a person places their efforts recognizing that no one can do everything. We should advise and support our colleagues and mentees in doing less so they can focus more. We should be strategic about service activities. We should be cautious about “add-ons”—that is, new mandates. These often arise as granting agency and institutional requirements. Are these worthwhile or just going to turn into bureaucratic fodder? Better institutional support is one way to manage scientific overhead. I predict that research organizations that maintain support personnel and protect scientific time will be more competitive in the future. There are more solutions to managing scientific overhead but the main point of this essay is recognition.

I have a gloomy vision where future scientists spend their days filling out online web forms and maybe in the late afternoon download data from somewhere for research before heading for home. A brighter view is the incredible and compelling opportunities we have now to advance aquatic science. We know our work is vital to understanding and managing changing seas and inland waters. We are called upon to do this work, and this is also why we must lessen the sapping of scientific overhead. St. Paul wrote in a religious context, “Do not be conformed to this world but be transformed by the renewing of your minds.” These words provide an elegant guide applicable to our scientific context. We should not conform to excessive scientific overhead. We should transform our understanding of aquatic systems through our research. This is the most foundational of our activities and one to which ASLO is dedicated.

Michael L. Pace, ASLO President (2018–2020), Department of Environmental Sciences, University of Virginia, Charlottesville, VA; president@aslo.org
MESSAGE FROM THE EXECUTIVE DIRECTOR

Interview with Brittany Schieler, ASLO Spring 2019
Science Communication Intern

Teresa Curto

In April 2015, ASLO launched a new science communication internship (http://aslo.org/news/2015-aslo-science-communication-internship/). This initiative is led by ASLO Director of Communications and Science, Adrienne Sponberg. The selected interns work with Adrienne on a variety of communication, social media, policy, education, and public outreach projects designed to provide direct experience in how science is communicated to a variety of audiences.

Brittany Schieler was selected as the Spring 2019 ASLO Science Communication Intern. She began working with Adrienne shortly after graduating with a Ph.D. in oceanography from Rutgers University in May of 2019. For my dissertation, I worked on a type of phytoplankton called Emiliania huxleyi, an abundant coccolithophore species, and the viruses that infect them. My research focused on how production of free radical chemicals, like nitric oxide, by E. huxleyi is involved in the viral infection process, as well as understanding what roles nitric oxide has in this alga’s physiology more broadly.

As I was finishing up my Ph.D., I decided it was important to take some time away from the lab bench and get a more wholistic view of science in society. I was particularly interested in pursuing opportunities in science policy to use my science background to assist policy-makers. The internship position at ASLO was perfect! It would enable me to get exposure to science communication on so many different fronts, all while being at the heart of the U.S. policy world in D.C. under the mentorship of the very knowledgeable Director of Communications and Science, Adrienne Sponberg.

ED: WHAT HAVE YOU LEARNED ABOUT ASLO DURING YOUR INTERNSHIP? IS THERE ANYTHING THAT SURPRISED YOU?

BS: One thing that really surprised me is how small of an organization ASLO is, given how much the society does! No, really. On my first day, I walked into the D.C. office and thought to myself “where is everybody else?” This is just indicative of how ASLO does its best to invest its resources first and foremost into serving its membership, especially the early-career researchers and students, and how dedicated the staff and volunteers (like the board and committee members) are to the society and its mission. I am impressed by all of the ways there are to get involved in the society and all of the professional development opportunities available for scientists at every career stage. One feature of ASLO’s new website is that all of these opportunities are now laid out in a more discoverable manner. Go check it out!

ED: WHAT WERE SOME OF THE PROJECTS YOU HAVE BEEN WORKING ON DURING YOUR INTERNSHIP? HOW HAVE THOSE IMPACTED YOUR OWN PROFESSIONAL DEVELOPMENT?

BS: One of my favorite aspects of the internship has been that no two days are ever the same! There is so much work to be done in this office and I was fortunate to get a little taste of everything. Thanks in part to having a bit of a longer internship relative to previous interns, my work has been incredibly varied. I have been managing ASLO’s various social media channels (including the new ASLO Jobs twitter: @aslo_opps), drafting member communications, assisting with marketing for ASLO journals, putting together virtual issues for the journals, helping the ASLO team get a new website up and running, blogging about timely issues in science publishing and policy, promoting ASLO programs and resources, and assisting with other programs such as the Global Outreach Initiative, LOREX, ASLO Fellows Program, the ASLO Awards, and Journalist for a Day. The internship ultimately helped me better understand the roles, capabilities, and limitations of scientific societies, refined my writing for diverse audiences, and taught me how to leverage social media for efficient science communication.

ED: YOU ATTENDED THE ASLO EDITORS STRATEGY DAY MEETING WITH OUR WILEY PARTNERS IN HOBBOKEN IN SEPTEMBER. WHAT INSIGHTS DID YOU GAIN FROM THE STRATEGY DAY MEETING?

BS: At the Wiley Strategy Day meeting, I was struck by the emphasis placed on the author experience by both sides of the Wiley-ASLO partnership. The editors spoke in depth about how best to meet the needs of authors, especially the early-career researchers, and were actively engaged on the up-and-coming trends in publishing like open access, open data, and transparent peer-review. In addition, the staff at Wiley was excited to share new tools and insights they had to address those trends, drive content discoverability and accessibility, and provide a positive author experience, all of which benefits the field as whole. Before the internship, my understanding of the publication process was rather limited and one-sided. Like a lot of young researchers, my impression had been that editors and publishers were just one hurdle, maybe even an antiquated one, to overcome in the sometimes long and tedious journey of publishing. I left strategy day with the sense that editors were allies for authors, not just gatekeepers, and that publishers provide many tools for authors as well as benefits to the association in a rapidly changing publishing landscape.

ED: YOU ALSO PLAYED AN IMPORTANT ROLE OVER THE SUMMER AND INTO THE FALL ON THE MAJOR TECHNOLOGY UPGRADE PROJECT AT ASLO, WHICH INCLUDED A REDESIGN OF THE ASLO WEBSITE. TELL US ABOUT YOUR CONTRIBUTIONS TO THIS MASSIVE PROJECT AND WHAT YOU LEARNED DURING THE PROCESS?

BS: On one of my very first days of the internship, I sat in on a call the ASLO team made with a potential third-party vendor for the web project. The new ASLO website launched in October. So, I had a unique opportunity to see this major undertaking from nearly start to finish. My role in the project spanned from being another set of eyes and ears on technical aspects of the project’s development to helping create, style, and organize various parts of the front-end website. I’ve actually learned so much about the association itself through my participation in the web project because an organization’s web presence is truly a window into its inner-workings and reflects its priorities. ASLO does a lot for all of
its members and it has been eye-opening to see just how many different pieces need to work together behind the scenes for a seamless user experience.

ED: BRITTANY, YOUR CONTRIBUTIONS TO ASLO HAVE BEEN OUTSTANDING AND SPANNED NUMEROUS PROGRAM AREAS WITHIN THE ASSOCIATION. WOULD YOU RECOMMEND THIS EXPERIENCE TO YOUR PEERS, AND WHAT WERE THE MAIN BENEFITS TO YOUR PROFESSIONAL DEVELOPMENT?

BS: Thank you! Serving ASLO in this capacity has been a pleasure and an honor. I cannot speak more highly of my experience as a Science Communication Intern at ASLO. Any current or recently graduated graduate student in the aquatic sciences looking for a stepping-stone into a nonacademic science career, or perhaps just a fresh perspective on science and society, should consider applying for this position. The office is involved in virtually every nonacademic science sphere to some extent, especially publishing, education, public outreach, social media/technology, and science policy. The position also allows for the intern to focus on one or a few specific areas of interest to them. For me personally, I wanted to learn more about science policy, so I shaped my internship with that overall goal in mind. I attended briefings on the Hill, interfaced with the Consortium of Aquatic Science Societies (CASS) on pertinent policy issues of interest to our membership, curated ASLO’s policy and public affairs resources and content, and networked with science policy professionals. I learned a lot about how policy is made and how science fits into the legislative process during my time here which has positioned me well to take on my next challenge—working as a 2020 Knauss Marine Policy Fellow on Capitol Hill.

ED: THANK YOU, BRITTANY.

MESSAGE FROM THE BUSINESS OFFICE

Helen Schneider Lemay

Climate change is a global issue that involves so much more than just our ice retreating and melting and water temperatures rising. An interesting program is evolving in Colorado called regenerative agriculture. The goal is to improve soil health, increase productivity, and capture more carbon from the atmosphere. Agriculture is a large contributor to climate change and CO₂ in the atmosphere. While this is not an overnight solution, every little bit helps. Cover crops, decreasing use of chemicals, diversity of crops, planting perennial grasses, and using compost are core principles of regenerative agriculture. (Clark, M. 2019, December 4. Agriculture is part of the climate change problem. Colorado wants farmers’ soil to be part of the solution. The Colorado Sun. Available from https://coloradosun.com/).

Change and innovation are being made in South America, with various groups working together. There is an organization called Future of Fish that puts fishers and their communities as their priority. They are passionate about reducing overfishing and protecting our oceans for future generations. In order to fish sustainably, fishers need to be supported economically and socially. The Future of Fish organization is focused on designing just systems and solutions to support fishers. Initiatives include working with open-air market vendors in Chile that has led to the formation of a new vendor cooperative: the Feria y Mar cooperative. They are also looking at information and communication technology can help small-scale fisheries with traceability and sustainability. Fishers face diverse challenges based on location, regulation, and climate. In Peru, they have started the Peruvian seafood initiative “Pesca Consciente, Ceviche por Siempre, an example of fishers working with restaurants to understand market preferences” (Future of Fish. 2019, December 12. Available from http://futureoffish.org/).

ASLO will be hosting jointly two meetings in 2020. They both will have many diverse speakers and sessions. Hope to see you in the Ocean Sciences Meeting in San Diego, California, or the Joint Summer Meeting in Madison, Wisconsin.

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HOW TO TAKE A PROACTIVE APPROACH ON YOUR NEXT SALARY NEGOTIATION

Maha J. Czesielski

Our current society is plagued with pay gaps; salary inequity is not only gender related but is also a severe and very real issue for people of color, the LGBTQ community, and other ethnic minorities. Numerous reasons exist for the presence of pay gaps, one of which is performance in salary negotiations. Studies to understand pay gaps have analyzed negotiation behavior, specifically related to gender. In the past, it was suggested that men may be better at negotiating than women. Recently, however, experimental studies showed that when removing variations in institutional factors such as power, status, position, and experience, women were as effective in negotiating as men (Whitford and Ochs 2019). The results indicate that the person negotiating is influenced by the opportunities and constraints of their settings. These extrinsic factors cannot be controlled by the individual and are too rarely acknowledged, but can have significant impacts on the outcomes of negotiations. This highlights the role that institutions, and our society, play in shaping workers’ behaviors. By fostering an environment in which equality (for all, not just gender) and open conversations about negotiations are encouraged, employees could feel more confident and achieve better results in their negotiations.

Having said that, there are intrinsic factors in every individual’s control. By understanding the dynamics of negotiation and honing preparation skills, everyone can do their own part in ensuring the best possible outcome of their salary negotiations.

THE RIGHT TO NEGOTIATE

Christina Macken, an expert in career development coaching and founder of Blueprintgreen Career Coaching and Consulting, recently shared tips at a salary negotiation workshop organized by the Women’s Aquatic Network. For starters, she says women need to commit to negotiating more. “When I conduct workshops for salary negotiation for new jobs, often fewer than 30% of the women in the room had ever tried to negotiate a salary, or even considered that it was an option available to them,” Macken says. The simple step in being confident in the right to start a conversation about salaries can go a long way over the course of an entire career path—both for women and men. Macken coaches her clients in how to overcome nervousness of negotiations, understanding your worth and creating a mindset that enables a more fluent conversation. Her tips for success are certainly not gender-specific—anyone can benefit from advice on how to negotiate. The first step of preparation is identifying the type of salary negotiation one is about to engage in.

THE TWO TYPES OF SALARY NEGOTIATIONS

There are two common scenarios in which one might find themselves entering a salary negotiation process. One is during the process of acquiring a new job. The other is during the conversation of a promotion. Macken notes that “the two scenarios of salary negotiations have some key differences between them, all of which inform the preparation process.”

When a candidate enters salary negotiations in a new job, there is usually no personal relationship with the person sitting across from them. Except for what is on paper, they do not know what the candidate is capable of. Yet, often, negotiations are expected and considered part of the hiring process. The negotiation is an inherently more collaborative process in which the job candidate has significantly more leverage than during a promotion. When considering a new job position, the candidate does not begin work or commitment to the institution until the negotiations are completed—this gives the candidate significantly more freedom. Because it is less likely that the new employer knows the candidate’s salary history, a new job is also the opportunity for one to rectify a previously underpaid position. All in all, coming to an agreement is imperative and therefore gives the job candidate strong footing in the negotiation.

On the other hand, promotion negotiations are a much more political process. More often than not, the conversation is instigated by the employee, making self-initiative extremely important. Furthermore, the salary negotiation may not necessarily be for a new position but for a job that is already being done. Seeing as the decision makers already know the employee’s current salary, there are also restrictions in how much they will be willing to increase. In general, the incentive for the organization to act is more limited. The benefit of the candidate here, however, is that they know the company and understand it in more detail. If utilized properly, this can be to their advantage.

An important difference to note between these two negotiations is time frame. New job negotiations “will take place over a discrete amount of time in the days (or weeks).” Meanwhile, promotion negotiations may not have a specific timeline and “can take place over the course of months (or longer)” explains Macken. The two scenarios will influence the way the candidate will approach the conversation, but ultimately candidates need to identify their market value and practice the conversation they want to have.

KNOW YOUR WORTH

Defining your worth for a salary negotiation is about understanding your market value. “Ideally, salaries are tied to the market value for performing the functions described in your job description, in the city you’re located, found through market research” states Macken. She recommends tools such as salary.com or similar sites to gain an overview of where they rank in terms of payment within their specific position and industry. The main goal is to translate your work into a salary estimate based on real market data. Equipped with this knowledge, you will be able to enter your negotiations prepared and informed. “The most common mistake is that people assume their current salary is related to (and should inform) their next salary,” Macken warns.

Once you have defined what your market value is, you need to define your priorities. Your compensation package can go a long way in helping you make a decision for a job offer or sweeten the deal for a promotion. Occasionally, there may not be more of an opportunity to raise the salary. Negotiating benefits and compensations are another way to increase the value you receive from a company. Determine what compensations are important to you and define how they could potentially be an addition to your negotiation discussion. Understanding how to use compensations to your advantage can provide alternatives for the salary.

The final step in determining your worth is your walk-away point. What is the minimum win that you are willing to take away from this? What losses can you afford to take? If it is a promotion negotiation: how long are you willing to wait to receive a salary adjustment? Are...
there other compensations you would be willing to receive to accept the current conditions? If it is a new job: do you have other job offers and how do these compare? Defining a walk-away point is important in order to define when you should cut the chase and decide to take alternative steps. The walk-away point is different for everyone and changes throughout our lives. It does not matter how it compares to someone else, it matters how it suits you and your interests in that moment. By being objective with one’s personal needs and informed with market research facts, personally appropriate walk-away points can be determined.

**THE TALK**

Once market research, compensations, walk-away points, and preparations have been established, the next step is executing the pitch. In conversations relating to a promotional negotiation, “it is incredibly important to maintain an ally mindset and view everyone involved as a partner to get ‘on your team’ in support of the promotion process” explains Macken. Establish a group of people that can approve your promotion and speak highly of you. Apply the same concept to your negotiations; see the other person as someone that you need to create an alliance with, not someone you need to fight.

With the negotiation talk coming up, be sure to prepare and practice your pitch. Macken recommends creating a GREAT speech:

- Gratitude for their time
- Reiterating the importance of the company to you
- Establish your value
- Ask for your target salary
- Time for silence

When nervous, it is often hard to let silence sit. However, it is imperative that you give some time for processing after you have completed your pitch. Silence also gives you a moment to breathe and indicates to the other person that you are ready for a dialog to begin.

In a perfect scenario, you come to a suitable agreement at the end of the negotiations. In many cases, particularly if it is for a promotion, you may be told that you will hear back. Macken recommends her clients to prepare a follow-up email shortly after the negotiations. Be sure to summarize your case, the general discussion, and reiterate your request. If there was a tone of uncertainty during the meeting, you may also ask for guidance as to the next steps in the process. From here on, it depends on individual situations. Whatever may come next, remember your research, your worth, and your walk-away point.

Overall, this article is a call to think more proactively about salary negotiations, regardless of gender and career stage. Ultimately, the process of the salary negotiations will primarily depend on you. “You are the only person who can advocate for you” says Macken. “It is your personal responsibility to ensure that the right actions are being put in motion, the right people are engaged, and the process is moving forward to ensure your compensation matches the value you bring to the organization.” There are many books worth reading that elaborate on more tools and skills that can be beneficial during negotiations.

While you cannot change all external factors, understanding your position and being informed goes a long way. Achieving a successful salary negotiation may be easier said than done, but in the end you will not know until you have tried.

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**DEMYSTIFYING THE MANUSCRIPT REJECTION LETTER**

Brittany Schieler

The academic twitter-verse has been buzzing recently with the chatter of failure after a Michigan State University doctoral student wore a skirt made of 17 rejection letters to her dissertation defense. What this story delightfully illustrates is that failure and rejection are normal occurrences in science. However, in today’s social media-focused climate where victories are triumphantly shared, and our shortcomings selectively ignored, it is easy to feel alone in our failure. For early career researchers (ECRs) especially, a manuscript rejection letter in our inbox can feel quite defeating during our career’s most critical formative years. At the recent Wiley Editors Strategy Day, the Editors-in-Chief (EICs) and Deputy Editors (hereinafter the editors) of ASLO’s family of journals spoke at length about their relationship with authors, both real and perceived, and the pain points authors may feel throughout the editorial process. Many of these pain points had to do with rejection: a lack of understanding the reasons for it, how to deal with it, and how to ultimately move the manuscript forward. I reached out to the ASLO editors to follow up on our conversations and get their take on this important topic of manuscript rejections (Fig. 1).

In this issue of the Bulletin, the Raelyn Cole Editorial Fellows (RCFs) present the results of a recent survey of the ASLO Associate Editors. One of the major themes that emerged from their responses echoes one of my main takeaways from the Wiley Editors Strategy Day: that editors genuinely enjoy their work and take seriously their role guiding and improving papers, especially for ECRs. Since my experience at Strategy Day, I started to view the editorial process as more collaborative than combative, and editors as allies for, rather than barriers to, publishing. In a recent blog post, RCF Fellow Kelsey Poulson-Ellestad discusses the concept of the “shepherd” narrative as an extension to the strict “gatekeeper” narrative to better describe the roles of editors (Poulson-Ellestad 2019). Another fellow, Scott Hotaling, also described in a recent tweet that, “Editors are human. They want to help you succeed!”

What are some ways that authors can leverage this shift in perspective to improve outcomes for their manuscripts? For one, authors can consider reaching out to their potential editors with pre-submission inquiries, especially when they are unsure if the paper fits the journal’s scope. Indeed, the editors I spoke with said right for the journal as one of the most common reasons a manuscript is rejected. By starting a conversation with the editor early, even before submission, an author can save time and effort by identifying appropriate target journals with the ease of a short email. In addition, the initial rejection may not
necessarily be the end of a paper’s chances in that journal. If you feel strongly that either a reviewer misinterpreted a critical component of your work, or that you can address a major issue that was identified in the reviews, you may be able to appeal the decision to your editor. It should be noted, however, that many of the ASLO editors I spoke with said that while they would welcome this sort of appeal, it is still rather rare for a decision to be overturned in this manner. The overwhelming consensus, though, was that a polite email to the editor can never hurt!

Lastly, many of the editors reiterated just how frequently papers are rejected. One editor added that, “it [rejection] is very normal,” while another implored authors to view rejections more positively. The vast majority of reviewers and editors provide thoughtful feedback, and this feedback ultimately helps the paper become better. It is important to not take critical reviews personally; one editor pressed that learning how to deal with and efficiently respond to rejection early in your career will only help in securing publications and improve your chances in the future.

In the end, many of the editors reiterated just how important it is to develop early in your career and continually improve your communication and management skills. Time management is a skill that can be practiced and learned. Time management is not just time management! It is important to realize that most scientists face challenges managing the demands on their time, from the tenure-track and tenured faculty (looking at you, graduate students and early-career researchers) to full professors and society fellows (I did not forget about you, mid-career researchers). And we as scientists are not alone in this. Business and industry spend a lot of resources to improve time management and ultimately productivity of their employees.

Luckily, ASLO Community members are here to provide recommendations on their favorite resources to improve time management.

I narrowed down my topic for this edition after Bob Sterner (Large Lakes Observatory, University of Minnesota Duluth) reached out to me after reading the last edition of my column. Bob shared a collection of resources that he curates entitled “Skills for Graduate Students” that is freely available online (https://sites.google.com/a/d.umn.edu/professional-skills/) and includes a section on time management.

Aeon, B. 2017. Why academics need to focus on structuring their time: it may well be the single most important predictor of well-being in academia. Available from https://bit.ly/2QzPeRp.

Tracy, B. 2017. Eat that frog!: 21 great ways to stop procrastinating and get more done in less time, Third ed. Berrett-Koehler Publishers, Oakland, CA.

Simply working until you are exhausted is not time management! It is important to realize that time management is a skill that can be practiced and learned. Time management is a topic in my “Skills for Graduate Students” resource. A couple of my favorites from that listing follow. For a very brief discussion about why you should build structure into your calendar, see Brad Aeon’s article. The recommendation to “assign time to tasks” instead of “assigning tasks to time” is a real gem because it will build more realism into your day (Aeon 2017). When you assign
yourself a task, get in the habit of estimating the time that task will take. This is a critical piece of controlling your commitments. But there are always going to be more tasks begging for your attention than you can effectively perform. For recommendations on how to prioritize, try the method of “Eat that Frog,” which means doing first that which you are most likely to procrastinate doing, but which will have the greatest positive impact on your life (Tracy 2017). Why wouldn’t you eat that frog!? – Bob Sterner, Large Lakes Observatory, University of Minnesota Duluth, Duluth, Minnesota.

As an example that challenges with time management are not restricted to the scientific community, Katelyn King (Michigan State University) recommended use of the Available-to-Promise tool found in a book edited by the Harvard Business Review (2005).

Harvard Business Review [ed.]. 2005. Time management: Increase your personal productivity and effectiveness. Harvard Business School Press, Boston, MA.

I use this (Available-to-Promise tool in chapter 3) because it is a good way for me to plan out a whole summer or semester, and then break it down into smaller parts, like the month, and then the week. It gives me a structure that I can open up for the day and see what I planned to work on, so that I do not just jump around to a bunch of different things. Finally, it can show me when I am in the negative numbers, that I do not have any availability to promise” to new projects. Or on the other hand, when I have months that I have a lot of time and might consider joining a new project. – Katelyn King, Michigan State University, East Lansing, Michigan.

**REFLECTIONS ON THE COLUMN’S FIRST YEAR**

I am writing this column with a nice warm cup of coffee (of course) on the morning of New Year’s Eve, which seems like an appropriate time to reflect upon what I have learned writing this column over the past year. And yes, I am writing the column this morning because I procrastinated until the publication deadline.

1. There are a lot of resources available to help with professional development. A quick Google search of “time management” retrieved about 7.33 billion results (in 0.58 s)! We could easily go online and try to wade through these results by reading endless reviews from people we likely do not know. For me, it is much more helpful to receive recommendations from someone that I know; someone from the ASLO Community that has likely had a similar academic background, shared experiences, and of course challenges, that I have likely had.

2. Not every tool or resource will work for everyone. I tend to seek a lot of advice on professional development from my mentors, collaborators, and friends, which means that I have a large collection of books on professional development. Some I have read. Some I have yet to read. And even though these recommendations came from someone I knew, they did not always “work” for me. It is important to find resources that are a good fit for you and re-evaluate that collection through time.

3. A large percentage of your colleagues do not use formal professional development resources. They have developed informal approaches through time, largely through trial-and-error. For this column, I send out a lot of emails to people I know (sorry to all of you!) and hit up the Twitter-verse (is that a thing?) for recommendations. By far, the most common response that I receive is that I do not have any formal resources that I use, I just do it by doing “fill in the blank.” Whether it comes from “this is how my lab used to do it,” or “my doctoral advisor did it like this,” or “I tried this once and it was really helpful,” again the important thing is to find what works for you.

4. Do not be ashamed to talk about challenges you are facing or to share with others approaches that helped you overcome challenges. I was once chatting with a colleague that I greatly respect, who is well-known in the scientific community and highly productive, about a skill set that I needed to improve. Their response mentioned that we see today’s most successful scientists and tend to think that they have always just been successful; that they did not face similar challenges early in their career. To me, that was an important realization. So, when you are chatting with colleagues during a social hour at the next ASLO Conference, make it a point to chat about professional development. Try to work an awesome new resource that you have discovered into the conversation. Or, ask your colleagues if they are using any new resources. They may be able to help!

**NEXT EDITION**

If you have any thoughts or critiques of this column, or suggestions for additional resources on this topic or for topics to cover in future issues, please feel free to contact me. You can email me at filstrup@aslo.org or tweet me @ctfilstrup. Please be sure to tag the L&O Bulletin (@ASLO_Bulletin) in your tweets.

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The gastronomy of the Balearic Islands reflects the tradition of the Mediterranean diet, based on seafood, fruits, and olive oil (Fig. 1). For instance, dishes like the Menorcan caldereta de langosta (lobster stew) or sepia a la mallorquina (cuttlefish with vegetables) are good examples. However, the most famous of all Mallorcan dishes sobrasada mallorquina, or the typical sweet ensaimada served during, for example, coffee breaks, together with lots of other traditional dishes incorporate an ingredient that might not seem logical for outsiders: pork. Sobrasada is an excellent example of tasty traditional food that has deep cultural roots. The making of sobrasada is a family (including friends) affair, culminating in a festive rite that denotes the beginning of autumn and is still celebrated widely, a reflection of the long-standing traditions of the local population. During the ritual slaughter of an autochthonous breed of pig (matança), nothing is wasted, and the pork loin and bacon are mixed with paprika, salt, and black pepper to produce the tasty cured sausage called sobrasada. Sobrasada can be incorporated as an ingredient in other traditional dishes or used as a spread on typical Mallorcan biscuits (e.g., on locally branded Quely biscuits, which date back to the 18th century). These small crackers are a sort of ship biscuit, formerly used as a long-lasting provision but now mostly popular as kids’ snacks and appetizers.

While with sobrasada the ingredients are easily identified, it is easy to forget that the excellent taste of the popular pastry ensaimada comes from the key ingredient saïm (Catalan for pork lard). This successful recipe, already referred to in writings of the 17th century, has been exported to the former colonies of Spain, the Philippines and Puerto Rico, where it is available under the names of ensaymada (Philippines) or Mallorca (Puerto Rico). So how did the land-based pig find its way into the traditional food of the Balearic Islands, which have a total shoreline length of 1723 km? The stone watchtowers dotting this same coastline give a hint of the answer: the strategic position of the archipelago made it a key to control the waters and thus the trade or warfare in the Northwestern Mediterranean Sea. The rugged coastline of Mallorca makes for excellent hiding places and pirates were thriving. Continuous raids caused farmers and villagers to move inland into fortified structures, which thus had to rely on other food sources, not associated to the coastline. Although saïm is an important traditional ingredient, vegetarians need not worry; excellent vegetarian dishes with extended tradition are available in almost every local restaurant. For example, tumbet, similar to the French ratatouille, for its ingredients: layers of tomatoes, aubergines, and red bell peppers fried in olive oil and topped off with tomato sauce; or sopes mallorquinas (bread slices in vegetable soup). And there is always the classic option of pamboli (literally bread with oil), where slices of (unsalted!) bread, rubbed with half of a tomato of a specific breed ramallet are dripped with olive oil, sprinkled with salt and optionally served with a topping like cheese, ham, or camaiot, another typical Mallorcan sausage.

After a meal, it is traditional to drink a small shot (chupito) of hierbas as digestif. Hierbas translates as herbs and is quite literally that: aromatic herbs soaked in anise liqueur, left in the bottle to enhance the flavor over time. Every island, even every family has its secret recipe, additionally to the various commercial brands available. During the social talk over chupitos of hierbas, maybe the story of mayonnaise will come up. This well-known condiment is allegedly named after the Menorcan port of Mahón, and originally a sauce prepared to celebrate the victory of the French Duke of Richelieu over the British in 1756. In a nutshell, there will be plenty of food for thought during the conference in Mallorca in 2021!

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Malcolm S. Knowles, Elwood F. Holton III, Richard A. Swanson

The Adult Learner: The definitive classic in adult education and human resource development, 8th edition; Routledge; 402 pages.

Most theories about learning and teaching have been derived from studies based on animals and children. Yet, in the United States alone over 10% and 25% of undergraduates enrolled at 4- and 2-yr university programs, respectively, are above the age of 25 (National Center for Education Statistics 2019) and Ph.D. students median age at doctorate award is 32 yr (National Science Foundation and National Center for Science and Engineering Statistics 2018). Although they are not children (nor animals), graduate school programs retain similar principals of teaching strategies as is applied in children's and adolescence's education. Malcom Knowles' adequately titled book “The Adult Learner: A Neglected Species” explores the fundamental differences between teaching children (i.e., pedagogy) and adults, known as andragogy.

Andragogy first appeared in the literature in 1833 and focuses on the science of learning in adults. Understanding how adults learn is the first step in optimizing teaching methods. Although the book spans large sections of elaborate discussion about the theories of learning and teaching, Knowles forms a perspective and teaching model for andragogy that significantly differ from pedagogy. Through numerous specific appendices, he elaborates on specific concepts in great length for those curious to learn more. One does not necessarily have to read those in order to grasp the fundamental message that Knowles tries to convey: The current methods of adult teaching are not adapted to adult learning, rendering them ineffective.

The book, first published in 1980, primarily targets human resource development in the industry. Nonetheless, the ideas and concepts of adult teaching have remained relevant to this day. Any adult, but especially those familiar with higher education and graduate school programs, will quickly find points raised by Knowles relatable. The lessons learned from his theory discussions, analysis of studies and accounts of personal experience are still relevant to anyone working with adult education, including academia.

**FUNDAMENTALS OF THE ADULT LEARNER**

In pedagogy, Knowles writes, the assumption is that the learner is too young to have real orientations that can dictate the learning process. Consequently, the learner is dependent on the teacher (or educator) to provide the direction of learning (i.e., the content to be learned). It results in a process in which the learner only needs to know what they are being taught in order to pass. Readiness and motivation to learn are driven by grades and approval.

Over time, individuals move through this phase into adolescence and gradually into adulthood. During these periods, changes in needs and perception begin to happen that affect the learning response of an individual. In andragogy, the personal (life) experience of the learner is an important trigger in how stimulus will create a reaction. This is also known as the S-O-R (Stimulus-Organism-Response), which is based on the individual’s perception of a stimulus. Knowles describes it as “I may know what I show you, but I do not know what you see.” He therefore defines new assumptions characteristic of adult learners:

1. **The need to know:** Adults need to know why they learn before they start to learn. They probe into the benefits that they will gain from learning.

2. **Self-concept:** Adults are self-directing, take responsibilities, and make decisions themselves. This poses a problem, as imposing and insisting on your way with them will often create resistance and resentment.

3. **Learner’s experience:** To a child, experience is something that happens to them; to an adult experience defines them. As such, adult learners are heterogeneous and individuality needs to be more adequately considered when engaging in their education. Knowles elaborates on ways to handle large group heterogeneity in chapter 5.

4. **Readiness to learn:** An adult’s readiness to learn becomes increasingly oriented by the developmental tasks of their social roles.

5. **Orientation to learn:** Adults are life centered. They learn if they perceive this will be useful.

6. **Motivation:** The strongest motivation for adults to learn is internal pressures such as desire to increase job satisfaction, self-esteem, or quality of life.

One can quickly see that the teaching of adults is therefore a fine art of its own.

**PRINCIPLES OF ANDRAGOGY**

Knowles developed a set of principles for the andragogical model of development. The fundamental goal of these principles is to transition the adult learner from the doctrine of dependent learner to a self-directed learner.

In order to achieve this, (1) adults need to be involved in the planning and evaluating of their instructions. Through this, the learner will feel a sense of responsibility toward his own progress, which will further drive commitment. Knowles highlights that due to the nature of an adult’s self-concept, (2) learning should be problem-centered and not content-oriented. Since adults are interested in learning subjects that have relevance to their professional or personal life, (3) educators should formulate objectives relevant to the learner, together. These do not have to be incredibly specific—quite the opposite actually. Objectives should account for plurality of outcomes.

At the heart of Knowles’ principles lies the learner’s experience. (4) The learner’s experience must provide the basis for the learning activities. Here, it is important to note that just because one is an adult, it does not mean that pedagogic models are not appropriate. The
educator has the responsibility to determine whether a pedagogic or andragogic model of teaching is best to begin with. For example, learners that are entirely new to content will depend on the educator to introduce information. Thus, a more didactic instructor is required. As the learner continues to develop, the educator needs to begin shifting responsibility of learning toward the learner, gradually making them self-directed. In the book, examples of methods are provided in appendixes I and J. A well-designed learning experience ultimately teaches what Knowles describes as learning how to learn.

CREATING A LIFE-LONG LEARNER

Most students leave school having been primarily taught how to be dependent students. When adults move into professional development or higher education, they are therefore often left in what Knowles calls a “culture shock.” Learners are expected to become self-directed inquirers but are not given a lead on how to achieve this. The process of learning how to learn is skipped in most educational programs. An example of these shortcomings can frequently be observed in new doctoral students. These are taught mostly pedagogic learning throughout their previous education. Yet, once in a doctoral program the learner is instantly expected to be self-directed and motivated.

The core message that Knowles wants to convey in this book is: If learning is a continuum, with self-directed inquiry being the highest form of learning, then we have an obligation to build teaching strategies at each level so that they help learners move up the continuum. As we look at Academic institutions to bring forth adults that will be empowered and encouraged to continue learning as society continues to go through rapid technological and social changes, andragogical teaching methods will be of essence.

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The Joint ASLO-SFS Summer Meeting in June 2020 will draw attendance from the freshwater community at large. Make plans to participate in this world-class meeting for aquatic science professionals and students — to share ideas and to further interdisciplinary research and cooperation.

**ASLO.ORG/MADISON2020**

**KEY DATES**

| Event                                    | Date                |
|------------------------------------------|---------------------|
| Session proposal deadline                | August 2019         |
| Session organizers notified              | October 2019        |
| Call for abstracts issued/Registration opened | 9 March 2020       |
| Abstract submission deadline             | March 2020          |
| Program schedule posted                  | April 2020          |
| Presentations scheduled                  | May 2020            |
| Full program posted                      | 7-12 June 2020      |