

PERSPECTIVE

Mentoring and Leadership in Aquatic Field Sciences During Unjust, Unsettling, Unpredictable, and Unprecedented Times

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CONTEXT

Science in a traditional university setting is commonly perceived as a place for pedagogy, a setting for intellectual freedom, and an anchor for theoretical and applied research that can lead to innovations and advancements across a wide range of disciplines. Professors in this context lead the charge by teaching in the classroom, the laboratory, and sometimes “off-campus” (e.g., field trips), as well as writing grants, conducting research, and communicating their findings. What professors teach is often based on curricula aimed at providing undergraduate and graduate students with fundamental and practical knowledge and skills that can assist in furthering their intellectual development and careers. The same goes for the engagement of graduate students, and sometimes undergraduates, in research, with professors providing training in experimental design, engaging with external partners, executing laboratory/field work, performing data analyses, and communicating science at a number of levels. In these roles, professors are expected to be mentors and leaders to those whom they teach and guide through the research process. Based on the common perceptions of students, we use the term “professor” broadly to include tenure and non-tenure track faculty, adjuncts who contribute to the academic mission (e.g., a government scientist who holds an unpaid academic appointment who mentors graduate students), research faculty who may not teach, and lecturers, all whom are influential and may be inspiring to students and others they lead.

What is often unseen and unappreciated is the level of responsibility professors shoulder when it comes to ensuring the safety and wellbeing of undergraduate students, graduate students, postdoctoral fellows, and technical staff they employ or otherwise supervise or mentor. Similarly, what also may be overlooked is that a university is a “workplace,” and depending on an employee’s duties, they are subjected to administrative and regulatory requirements to keep them physically safe, avoid discrimination, and be part of a productive, congenial work environment. As such, it is mandated to take university-sanctioned training courses such as basic first aid, laboratory safety, diver safety, animal care, working with human subjects, and diversity and inclusion. It is also mandated institutionally for all to know and follow laws that protect students from gender discrimination and sex-related harassment and assault (e.g., Title IX civil rights laws and the Clery Act laws, respectively, in the United States). However, for professors there is

much more behind the scenes when it comes to anticipating and planning for risks to themselves and those they lead and mentor. Where this becomes exemplified is when teaching and research happen off campus, and especially in remote settings, out of range of 9-1-1 service, more than a few hours from definitive healthcare, and without the ability to consult with the professor in real time (i.e., via cell phone or two-way radio). These responsibilities and realities of being a professor are frequently not communicated to those they mentor and lead, which can create tensions related to why things need to be done in a certain way, or even what the legal ramifications are if negligence is implicated when (not if) an incident occurs. Moreover, these issues can be exacerbated in the broad disciplines of fisheries and aquatic sciences, largely because of the hazards of being near, on, and in the water, which present inherent risks.

Although our personal context is nested in experiences within a university setting, individuals in fisheries and aquatic sciences at government agencies, non-government organizations, and consulting companies who oversee and mentor field crews are also faced with planning for risks and dealing with unexpected challenges. For field research in fisheries and aquatic sciences, potential risks can be quite stressful for a seasoned individual or team, from the threat of drowning, wading and boat navigation in fast flowing rivers and streams, to dealing with complex coastal hazards, waves, tides, and unpredictable weather. Moreover, travel to aquatic environments requires traversing the land, thus those engaging in fisheries and aquatic sciences require an understanding and appreciation of terrestrial-based risks as well. This added complexity can elevate the need for due diligence, planning, preparedness, and associated responsibilities of professors, but even more so when extrinsic, unpredictable, and unprecedented events occur, such as the global COVID-19 pandemic in 2020/2021. These are indeed stressful times that are pushing the limits and capacities of individual professors, collaborative research teams (including graduate and undergraduate students), and the very institutional framework and foundations of the universities under which they are housed. In fact, to say these are unprecedented times seems to be an understatement, since what seems unprecedented one day is soon topped by unforeseen changes and the need to adapt again soon after plans are updated. Unprecedented times are periods or sequences of events that are well beyond what any training and experience can provide, however the way

we cope can be shaped by what was experienced during the “old normal.” Given the path of humanity, learning from past challenges and how we are dealing with the current crisis can help prepare us for the next hurdle—big or small.

With collectively over 30 years of trial and error as mid-career professors, educators, and mentors in fisheries and aquatic sciences, we write this perspective because we believe that by sharing our strategies, experiences, and personal challenges, those entering academia or similar mentorship and leadership roles particularly in fisheries and aquatic sciences can better understand and appreciate why and how certain decisions are made, and what can keep us up at night, beyond preparing lectures and writing grant proposals. Although some of this may seem elementary, we feel that many of the points below may simply serve as important reminders for even the seasoned professor or anyone in a mentorship or leadership role in fisheries and aquatic sciences. Lastly, and most importantly, we write this fully acknowledging that we are two privileged, cisgender, straight, white men in a discipline plagued by injustices related to diversity, inclusion, gender, and race, and hope that much of what we reflect on brings to light additional challenges for underrepresented groups in the field of fisheries and aquatic sciences.

DEFINING UNJUST, UNSETTLING, AND UNPREDICTABLE

What do we mean by unjust, unsettling, and unpredictable? An unjust situation is one in which statements or decisions are made or actions are taken that may be perceived by students and team members as unfair or inequitable. In our experience, this is most often manifested in our labs as biases that are imposed on team members by external factors, by the educational system, the institution, and peers. For example, sometimes how a team member is treated by stakeholders in the field is dictated by gender. From having team members spit on by community members to unwanted sexual advances (harassment)—our team members have seen a lot. Bullying or other forms of verbal harassment are also common as team members are blamed for wasting public funds or their failure to “make fishing better” in a given location.

An unsettling situation can arise from injustices, such as when tensions created by disparities in values and inherent biases erode the working relationship among team members. At times this is influenced by the composition or actions of team members, and whether discretion is used when making decisions that could be risky. It can also be quite unsettling to stumble across a body floating in the water (this has happened twice) or having a police SWAT team commandeer a research vessel in darkness for reasons they cannot discuss. Unsettling times also occur when broader societal and political crises happen, such as being at a remote field station when the 9/11 terrorist attacks occurred in the United States, or, more recently, with the rapid escalation of racial tensions and incidences of police brutality against protestors. These factors can rattle even the most experienced research team, making “everyday” risk management and the nuances of remote (or even urban) settings more challenging and stressful.

Unpredictability is woven into this via the probability that something dangerous or threatening will happen, or how certain risks are simply unforeseen. When planning field work, there are things that an individual or team can prepare for, such as equipment failure or the weather rapidly changing from benign to inclement. This also includes pre-existing medical conditions of team members, such as allergies to insect

bites and stings, and the need to carry an Epi-pen and how to deal with anaphylaxis. For these, training and preparedness can help reduce risks and ensure individual and team safety. However, the level of risk and its influence on safety escalates when the field environment is highly dynamic and keeping people safe depends on how an individual or team copes with unforeseeable risks, crises, or “acts of god.” This also includes individual variation in experience and tolerance to field work; e.g., long days, repetitive duties, and isolation. Even the most seasoned team members can become physically and mentally exhausted from field work, even though it is an enjoyable activity that many live for.

What we strive to avoid are unpredictable situations that put our students at high risk of physical injury, emotional strife, or both. Essentially, we want and need our students and teams to stay safe, and we must also lead by example, as well as uphold many layers of responsibility as a leader, mentor, and employer. We both still shake our heads in disbelief when it comes to the myriad of risks and safety concerns our teams face. Driving vehicles remains among the most dangerous thing our team members do—especially working in remote and rural locations where moose and deer collisions are more common, and in the north where roads can be snow covered. We also work on water, so drowning and other hazards are possible. Unpredictable dangers extend to much more insidious things, including when three of our team members were intentionally shot at in a location that was over an hour from the nearest police station. Sadly, two of our team members have been sexually assaulted at field sites. And then there are elephants, poachers, ticks, military and political roadblocks, civil unrest, tear gas, death threats (usually from online sources), small storms rapidly turning into hurricanes, and the list goes on. Most unpredictable was the emergence of a pandemic that has now added much uncertainty to all of our lives. Included in this are recent experiences with graduate students conducting field work in another part of the country as states and provinces began locking down in an attempt to isolate from the COVID-19 outbreak, all as university administrative travel restrictions were being established and amended as the context of the pandemic rapidly changed.

STRATEGIES FOR DEALING WITH UNJUST, UNSETTLING, AND UNPREDICTABLE TIMES

Although unjust, unsettling, and unpredictable times can also create safety issues on campus, we will continue to focus on the context of being off campus and doing field work in fisheries and aquatic sciences as we reflect on the strategies we have developed over the years to reduce risks and manage expectations for ourselves and those we lead, mentor, supervise, and employ. We also preface this section by acknowledging and embracing that we both tend to lead our lives with a growth mindset, and value how personal and professional growth can be enhanced when we are “outside our comfort zone” and through diverse experiences. For us, halting field work and adjusting our research portfolios so that they are more on campus is not an option. Implicit with field work is the strong probability that we will not be with a team member when they experience and respond to situations that are unjust, unsettling, and unpredictable. At times, we could be only a phone call or short drive away from where our teams are, but our work is also global, meaning the potential for much less accessibility whether for basic advice or to deal with an extreme crisis.

We add that our perception of risk and concerns for the wellbeing of those we mentor have been amplified after becoming parents ourselves and realizing that our students are somebody's child or loved one. We desperately want to protect our team members, but still want them to grow personally and professionally, and have the opportunity to experience the joys and inherent challenges of field work and everything else our world has to offer. We also still vividly remember the experiences, good and bad, that we had when conducting field work as students, and hope that through our guidance those we mentor will stay safe well beyond the time in our labs.

So how does one develop a strategy for mentoring those we lead and try to inspire them without becoming a "helicopter" mentor or micro manager? We have both at times said "I will never send a team member back to that region or country" after something awful has happened to a team member, only to have them lobby to go back. It isn't easy, and below are some strategies that we have developed over time. These are presented recognizing that they remain imperfect and a work in progress, but we hope that they stimulate thinking for those with relevant experiences and expertise to share, or for those who are thinking about entering a career that includes mentoring others and having the responsibility and sincere desire to keep everyone safe and healthy (physically and mentally).

We also acknowledge that our perceptions of potential risks are likely biased because of who we are and our lived experiences, even though we make considerable efforts to learn about and include in our strategies differences in the threats and challenges among different groups based on race, gender, sexual orientation, religion, and past personal experiences. Providing students and others we lead with tools that allow them to cope and be resilient when situations arise must be derived from diverse experiences. We also feel that it is valuable to offer words of encouragement and support, and to be there for those we lead and mentor.

Embrace Transparency in Decision Making

Making sure that all team members have a voice and opportunity to contribute to projects is (or should be) the norm in field work. Yet, there is a hierarchy of responsibility in any workplace and liability such that although consultation is essential, it is the ultimate responsibility of the leader to make decisions and be accountable for them. Recognizing that any decisions that are made (e.g., cancelling a field trip) will have impacts on team members, it is essential to embrace transparency in the decision-making process. That is to say, although the decision making itself may not always be democratic, the basis for a decision (relative to alternatives) should always be openly discussed with team members. There have been tough decisions that we have had to make where a team member or entire team does not like a given decision, but we do our best to be transparent as to why a decision was made. This is fortunately a rather uncommon path and, in most instances, decisions are achieved through extensive discussion and consensus. Nevertheless, a culture of transparency must be developed and maintained, not only in decision making, but with any aspect of field work that could elevate risks.

Create an Atmosphere of Mutual Respect and Trust

It is a natural extension from a culture of transparency to one of mutual respect and trust. Although academia can

be hierarchical because of different levels of training and responsibility, we certainly try to foster respect and trust when it comes to the fact that both mentor and mentee are human, that people make mistakes, and that life can be unfair at times. Tied to this is an assumption of good will. We also approach mentoring as simply being more experienced and further along in our careers than most we lead, but are still very open-minded about learning from those in our labs even if our ages are separated by decades or degrees. Transparency, respect, and trust also apply when personal or family matters influence someone's physical and emotional wellbeing, and how that can be translated into difficulties in the field as well as how decisions are made. Sometimes we are put in the difficult situation of not legally being allowed to ask about pre-existing conditions (medical, psychological, or otherwise), yet if we are aware of them, we can then make any accommodation needed. We have had team members enter into situations that are a danger to themselves and others because we did not know of and were not legally able to ask about pre-existing conditions. In remote field locations, this can create huge problems and really calls for trust and transparency. Also related to trust is creating a culture where our students know that we will "have their back" if a situation arises, unless true negligence or irresponsible behavior is evident. This can build mutual respect that can bolster self confidence in those who are being mentored, and foster greater success whether in the field, or when back behind a desk, at a conference, or as a mentor themselves.

Acknowledge the Blurred Lines between Work and Life

Field work can be extremely exciting and rewarding, but it is not a hobby. It is a work activity undertaken by trainees and professionals. Yet, field work is an activity where there is often a blurred line between work and life (or work and play). Consider a scenario where a team of four are working at a remote field site for 2 months. They live under the same roof, they cook together, they socialize together, and they do field work together. They are not technically working 24/7, but at the same time the situation they are in (i.e., shared living) is entirely dictated by the work. In such situations, transparency, respect, and trust outlined above are critical, not only between us and the individual team members, but among the team members as well. Simple inconveniences and differences in the way individuals cope can transform what is normally something that is easy to shrug off into a matter that creates rifts in the team, resulting in unjust decisions and unsettled situations. This is when being transparent with our teams about our expectations and broader awareness is critical, whether it is regarding personal and professional behavior, respecting differences among team members, or unconscious biases. For instance, chores and cooking meals while in the field should not default to female team members, and similarly trailering and piloting the boats should not default to male team members. We also try to encourage compassion and understanding, and trust that those we mentor and lead will also understand how we strive to promote finding work-life balance. Woven into all of this are pressures for students to succeed by fulfilling not only their own expectations, but those of their mentors, partners, stakeholders, and peers. Such pressures can leave those we mentor and lead to be especially vulnerable to "burnout," as well as psychological distress and even self-harm. As mentors it is important to be aware of this, identify the

signs, and intervene when necessary, but this also has to be something that is part of team dynamics (i.e., watching out for and taking care of each other) when the mentor or leader is not around or available, as in a remote field work setting.

Develop a Plan

It is impossible to plan for every scenario, yet the planning process prepares team members to consider the things that they may encounter and then develop strategies for dealing with them. This is really where a detailed appreciation of what the scope of foreseeable risks may be, determining the probability that the risks could manifest into an issue of health and safety, and devise the best means to reduce the chances of an incident or crisis occurring. Planning takes time and effort, and this must be built into any timeline. Planning early can help identify need for specialized training, safety equipment, and contingencies. The general approach to risk assessment planning is transferrable so even though there may be instances that were entirely unanticipated (e.g., example of being shot at per above), it is possible to adapt in real time. In our labs, we work to create a culture that acknowledges that what we do in the field can be risky, that there can be a difference between perceived and actual risks, and that planning and continuously evaluating risks in real time are an essential part of doing field work. We also work collaboratively with those we mentor to think through solutions and contingencies to mitigate risk and adequately respond if something unpredictable occurs.

Engage in Frequent Communication

When the people we mentor and lead are conducting field work, we have a policy where in the case of emergencies (no matter how large or small) it is imperative we are contacted (by phone, if possible) at any time of day or night. Even if the issue seems manageable and the team is able to solve it on their own, we work to instill in our teams that we must remain in the loop. We also try to schedule regular check-ins with team members, both as a group and individually, to help identifying problems before they arise. Even if we have teams halfway around the world, we make sure to plan ahead and ensure that there are adequate ways to communicate. Sometimes it means getting up extremely early, staying up very late, adding to or beefing up line items to budgets for communications, and asking our families to be extra patient, but in the end, being accessible to those we mentor and lead is critical to keeping individuals and teams safe.

Empower Team Members to Act

Team members will have to make real-time decisions that influence their wellbeing and safety. It is important that team members are empowered to do so and know that they will be supported. Likewise, we acknowledge that how we perceive and respond to risk in the field can be different than how our mentees will perceive and respond to risk. Creating an atmosphere that allows those we mentor and lead to make choices in the moment and vocalize their perceptions of potential and observed risks without fear of judgement is a must. Action often has consequences, such as spending money or impacting the ability to do the field work, which can make team members hesitate when action is urgently needed. In our labs we have a policy that team members can spend lab money (not their own money) related to safety at any time without consulting us, such as needing to purchase new brakes or tires for a field vehicle when it is away from campus or changing a flight or

buying an entirely new ticket to get out of an unsafe situation. Similarly, we do not believe that field work should happen no matter the cost. There is always tomorrow, so if an action (e.g., taking a few days off to recharge or pausing a field project due to inclement weather) impedes field work, in most cases there will be another opportunity later. It is also important for team members to know that they can seek assistance from first responders as needed. We have observed a reluctance to contact relevant authorities (e.g., police, medical professionals) for an issue without first checking in to see if they are “allowed to do so.” As such, we hope that through adequate planning and discussion, including ample transparency, that individuals and teams will feel that they have the capacity to work and respond independently, but also know we are available to consult and support as needed.

Learn from and Get Help from Others

What sets university-based field research apart from other groups that send people into the field, is that we, as principal investigators and mentors, end up being the main coordinating body for nearly all aspects of the field work. This requires some level of independence about how we set up guidelines, policies, and expectations for teams. However, it does not preclude us from learning from other individuals and groups, since there is no need to reinvent the wheel, so to speak. Organizations that regularly deploy hundreds if not thousands of people around the world, such as the Peace Corps, various charities, the diplomatic service, and the military, have more formal structures, prescribed policies, and many decades of experience when it comes to planning for risks and successfully responding to incidents. Taking the time to review how others deal with unjust, unsettling, and uncertain times, especially as they relate to individual and team health and safety, should certainly be a priority. In learning and appreciating this, a key take-away is the importance of not being hesitant to use local assets for help. For example, we had an issue where a team member was assaulted in a different state/province but did not want to abandon their field work. The solution was found by reaching out to a local university so that the team member could connect with their counseling services for support.

Tied to all of this is feeling comfortable with openly sharing our experiences about how we have personally dealt with situations, and not just the mechanics behind it, but how we felt emotionally, the administrative aspects of reporting incidences, and how we personally learned and adapted based on past challenges in the field. There is great value in fostering peer-to-peer support networks within the lab and among students, creating a culture of awareness for the wellbeing of others. This also applies to how students observe their mentors and leaders, and the mutual removal of barriers that may inhibit revealing emotional struggle. Thankfully, things are changing in the way our society views mental health, with greater awareness and resources available. In fact, in addition to physical first aid training, it would be wise to conduct psychological first aid training, especially for teams that can be in remote settings for long periods of time, and/or under challenging conditions. Whether through formal team meetings, informal conversations, or even classes we teach on field work and risk management, we feel that it can only help those we mentor, teach, lead, and inspire if we share the personal and professional realities of doing field work and how we cope with unjust, unsettling, and unpredictable times.

CONCLUDING REMARKS

It is a constant and evolving struggle knowing that the people we mentor and lead are put into situations that are unjust, unsettling, and unpredictable during their field work. Knowing and appreciating that our students and teams are exposed to stresses and risks certainly contributes to sleepless hours, knots in our stomachs, and replaying scenarios over and over in our heads. This all differs from an on-campus experience where there is easier access to resources and where there might be more familiarity as to how support systems work. When it comes to field research in fisheries and aquatic sciences, we want our teams to have formative and positive experiences with their journey as trainees eager to learn and budding scientists embarking on exciting careers—not be physically and emotionally scarred by their field work.

For many in fisheries and aquatic sciences, as well as the broader disciplines of ecology, evolution, and environmental science, field work is a big part of why they entered the profession. As one of our mentors used to say, it is about embracing whether you want to be a “lab coat” or a “plaid shirt,” or more specifically, whether you are willing to eat your lunch in the pouring rain, being eaten by bugs, and smelling since you haven’t showered for days. When individuals are making this decision, it is important to remember that although field work can be enamoring, it is different than hiking for fun. Field research still needs to be treated as a work activity involving the same necessary responsibilities and planning as working in a chemistry lab on campus, but there must be physical and emotional room for additional layers of planning and risk assessment. We are not saying that one is better than the other, and in some cases both on-campus and off-campus research is part of a particular research project or career tract. What we do emphasize is that those excited by the idea of field work need to embrace and respect the additional complexities related to risk, especially in remote settings.

Knowing that we cannot completely ensure the wellbeing and safety of our team members is personally stressful, because we care about them deeply and we are personally and professionally liable. Dealing with this can be emotionally draining for those mentoring and leading, especially when field work is far afield, and as human societies are faced with seemingly more unjust, unsettled, and unpredictable times, such as what we are currently experiencing with the COVID-19 pandemic and racial injustices. Even since first drafting this perspective, the challenges related to COVID-19 have ebbed and flowed as waves of infections continue to emerge. We ourselves are reaching out to peers and institutional administrations to help wade through current challenges, especially since there is no pre-existing roadmap as to how best to cope. What is a solution one day changes the next, and not only do those that mentor and lead have to adapt, but they have to be able to effectively communicate the challenges to those they supervise, who are also dealing with personal issues related to COVID-19. We submit that our community is poorly prepared for all that field work entails, especially in these unprecedented times. An additional emerging challenge is addressing long term planning tied to our own ambitions as well as the ambitions of our students. Managing expectations will continue to be



Figure 1. Challenges faced by our teams during field work: (A) boat trailer issues and associated troubleshooting; and (B) teaching a field course in a tropical storm.

difficult, especially when we begin asking deeper philosophical questions related to what the future of field research should look like, especially for those who have established a strong international research program. Nevertheless, given the nature of fisheries and aquatic sciences, field research will remain essential, and this sentiment is true for many other disciplines in the natural (and social) sciences. With that, the ideas shared here will hopefully help others to be more proactive and ensure that field work can be conducted in a way that develops coping strategies and resiliency for both the mentor and mentee as unjust, unsettling, and unpredictable times continue to ebb and flow.

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