

May 19, 2022

To: Seth Bodnar, President, University of Montana

From: Pamela Matson, Goldman Professor of Environmental Studies, Stanford University

Subject: Letter Report: The Future of Environment and Sustainability at the University of Montana: Perspectives on Challenges and Opportunities.

Dear President Bodnar:

Thank you for the invitation to contribute ideas and suggest options for the University to consider as it seeks to build a high-quality portfolio of educational opportunities and collaborative efforts in the broad area of environment, natural resources, and sustainability. Over the past six weeks, I have had detailed zoom, phone or in-person conversations with more than two dozen individuals from across the faculty, staff, and administrative leadership and have met with groups of faculty and students representing individual units. (Brad can provide the lists if needed.) I have also had access to and have reviewed recent written documents for several different units on campus, including departmental and program reviews, strategic initiatives and planning, educational program curricula at the undergraduate level, and more. Unfortunately, I did not speak with undergraduate students, although some of the graduate students with whom I spoke were themselves undergraduate alums. I've come away with great respect for the University of Montana's current strengths and contributions in the area, some concerns about the cultural and financial issues that impede its forward movement, and great enthusiasm for where it could go next. I am very happy to share those perspectives.

As I do so, I will speak to you in a relatively open and perhaps non-politic way. I acknowledge that I have only my impressions to share, and they are based largely on conversations with faculty, students, staff, and leaders from around the university and some reading. I have not deeply examined and analyzed all relevant units of the university, nor do I thoroughly understand its organizational nor funding and billeting approaches; no doubt there are things I do not fully understand. I believe, nonetheless, that my perceptions will be useful both because of my knowledge, experience and past roles at Stanford and other academic institutions and because those with whom I spoke seemed quite forthcoming in their opinions.

In the following sections, I will briefly summarize what I have learned about the most important strengths the university possesses and major challenges it is facing (most of which are already well known to you and other leaders). I'll then devote most of this letter report to options for moving ahead, focusing on what I consider the best option and then suggesting some alternatives.

## Strengths

### ***Breadth of Faculty Expertise and Engagement***

As an outsider, I have been very impressed with the presence and quality of environmental faculty and programs (including majors, minors, certificates, graduate programs at all levels, etc.) across the university, including in the Colleges (or Schools) of Humanities and Sciences, Forestry and Conservation, Business, Law, Human Health, and others. Faculty focus on a range of resource issues (e.g., forests and rangelands, agriculture, water, minerals, soils, ecosystem services, parks and recreation), environmental issues (e.g., ecological change, ecosystem degradation and restoration, biodiversity conservation, climate change, atmospheric dynamics and pollution, water quality and quantity, fire, other hazards), and human-environment interactions (e.g., laws, regulations and norms, finance and business, policy and decision-making, ethics, health, tourism). In research and graduate education, moreover, many faculty are engaging in interdisciplinary teams and there seems to be an appetite for more. Faculty in some of these units engage mostly in teaching; in others, they are full-heartedly engaged in research as well. A good number of individuals are interested or dedicated to working with and sharing information with decision makers and stakeholders outside the university. Many of the faculty are truly working toward *sustainability* goals – *combining different disciplines and different kinds of knowledge to help equitably meet the needs of people, today and in the future, while sustaining the 'life support systems of the planet' - our environment, ecosystems, and resources*. Very few universities that I know can say the same!

The breadth of university engagement in environmental, resource and sustainability issues is impressive. Of course, the fact that the university is in the state of Montana makes this breadth of engagement understandable – resource and environmental issues have been and continue to be central to the state's success and to its peoples' sense of place and well-being. Not surprisingly, several of the university's environment and resource programs have been in place for more than 50 years. But, clearly, the university administration's efforts over recent decades to encourage environmental teaching and research, as well as well-funded and supported collaborative projects like the 'Food Energy Water' Bridges Program and other EPSCOR programs, have made a big difference in terms of faculty numbers and collaboration (many people refer to them). From the documents that I've read, various administrations over the last several decades encouraged this "green thread" twining through so many departments and across colleges. Unfortunately, some of these efforts (especially later ones like the Communities of Excellence efforts) are perceived by many faculty as having led nowhere, with high costs in terms of participation and planning time and low returns on investments. Yet it is undeniable that UMT has built up an amazing breadth of strengths, and that working together is something valued by many. The presence of excellent and committed faculty in so many different areas of the university is a great strength of the university. It was exciting to hear about the many ways that individual faculty and programs interacted with each other – in research, graduate student advising, certificates, minors, and other kinds of educational opportunities – although it was also clear that many faculty felt that they were very limited in their ability to collaborate in educational programs due to the competitive environment.

### ***Core Academic Programs on Environment, Resources and Sustainability***

Another great strength for the university is the fact that, in addition to the dispersed strengths, there are also several units focused solely on environment, resources and sustainability challenges: Environmental Studies Program (hereafter sometimes referred to as EVST), multiple units in the Franke College of Forestry and Conservation (hereafter referred to as the Franke College), the Geosciences Department, and the Wildlife Biology Program (shared between the Franke College and H&S); I'll refer to these programs as "core" programs. One-on-one, I asked some of the faculty members from these different units if they thought the faculty *within their unit* had a common goal and if so, what it was. While they used somewhat different phrasing, they converged around "using the best knowledge and approaches to be help solve problems related to our planet's environment and resources and people's well-being...and to educate students to do so" or "using interdisciplinary problem solving and education to help address environmental and sustainability challenges" or "be effective stewards of our planetary environment and resources." For those units that are engaged deeply in research, it appears that much of the research is use-inspired and intended to be useful and used for problems that matter to people today and in the future.

While these core programs have missions with strong resonance with each other and overlap in some ways, they have some differences that can be easily missed (especially given the rhetoric about what each one does for undergraduates). A careful analysis of the programs is not needed here, but I'll share at least a few elements that I find especially important.

Environmental Studies as it stands today is, I think, at the leading edge of programs that emphasize environmental humanities and the engagement of multiple ways of knowing in the design of solutions. In its BA undergraduate major (Environmental Studies), students are taking courses in and engaging in environmental ethics, literature and journalism, law, Traditional Ecological Knowledge (TEK), Indigenous rights, environmental justice, and so on, as well as some social and natural sciences. While some faculty say they are training 'activists,' (much to the distaste of some faculty in other programs), I think more broadly the faculty are trying to train leaders who can engage as *change agents* in a variety of career pathways. While I think careful thought is needed about how to do that well in today's rapidly changing world, I think the goal is highly valuable and important for the university. The department has mostly interdisciplinary faculty members; the faculty size is quite small, having lost faculty due to retirements with few replacements. Its more recent hires have brought strength in the humanities areas, but environmental science areas have experienced attrition. Some of the faculty are very anxious to regrow that strength (although some are defining environmental sciences, in my opinion, in rather 20<sup>th</sup> century terms). Their interest and investment in food systems, with some expertise in that area and the wonderful PEAS Farm for practical learning are, I think, very important for the university.

The Franke College has a very strong and collegial community of social and biophysical scientists who provide disciplinary and interdisciplinary training and engagements for their students. It is organized around three departments (Society and Conservation, Ecosystem and Conservation Science, and Forest Management) and several cross-cutting degree programs.

Despite the fact that non-Franke College people always refer to the college as ‘Forestry,’ the department of Forest Management is a rather small department whose faculty numbers are declining (apparently now half of the number at the high point of the program). Faculty in the department lead or are engaged in the university’s major Fire Center; others work on issues related to forest restoration, forest ecology, and forest and range ecosystem management (including the use of data analytics and spatial information systems). In the Society and Conservation Department, a range of social science disciplines are included, including geographers, political scientists, anthropologist, psychologists, ethicists, etc., with many of the faculty dedicated to interdisciplinary social-environmental systems teaching and research. The Ecosystem and Conservation Science department includes a broad range of biological and physical disciplines addressing wildlife conservation, ecosystems goods and services, recreation, and many other topics. Educational programs (both undergrad and grad) are orthogonal to the departments, and departmental faculty typically engage in more than one. The Environmental Sciences and Sustainability undergraduate program is relatively new and growing, with a common core and six tracks or concentrations. Like EVST, the educational programs of the College are producing students who engage in government, non-governmental, and corporate entities after graduation, and some also take academic paths. Unlike EVST, most of the faculty in the College are heavily involved in research as well as teaching and many are engaged in research collaborations with faculty inside and outside the College. Graduate students are *relatively* well-supported thanks to research assistantships. Some EVST faculty tend to try to differentiate themselves by saying they are the only interdisciplinary program in the university, but some of the Franke College faculty members are interdisciplinary as individuals and many more work in and value interdisciplinary collaborations, and all their educational programs are interdisciplinary, including the ‘far-field’ interdisciplinarity focused on social-biophysical interactions. Having both strong biophysical and social sciences in the College is a very great advantage, as is the more important fact that those faculty seem to know each other and many work and teach together.

One clear advantage that the Franke College has is that its educational programs do not directly compete. The undergraduate and graduate degree programs do not reside within departments but across them. They were apparently designed to use faculty strengths relatively efficiently, with courses and faculty engagement typically used in more than one. They are not internally competitive in their focus, and success in one ‘raises all boats’ in the College.

Geosciences has a very small, excellent group of faculty who represent a range of physical science disciplines in Earth Sciences; they have lost faculty due to retirements over the past few years, leaving them now with low numbers and more strengths in the hydrologic sciences relative to other areas. Their undergraduate program is very small and declining (a situation that is being experienced by most other university-level geoscience programs in the United States), but like the Franke College, their graduate students and research programs are strong. Their faculty engage in climate and climate change; energy, water, minerals, and other resources; and hazard and risk – areas that are also Franke College interests. While some faculty members are anxious to retain their ability to graduate geoscientists, I took away the

impression that many of the faculty in the department see opportunities for deeper interactions with the Franke College, if they could be assured that their interests would not simply disappear.

The Wildlife Biology Program is jointly held by the College of H&S and the Franke College, with the Franke College providing the administrative support, a majority of the faculty, and teaching the majority of courses. In terms of reputation for research and teaching, the program is #1 in the US (and probably the world), thanks to the excellent faculty drawn from both colleges (helped no doubt by its location in Montana). While there are challenges to this joint situation, there also appear to be benefits that accrue from the support, numbers, and broad strengths of the faculty from two different academic units. The Wildlife Biology Program seems to be exceptional in that it is a highly successful program held across colleges. According to its faculty leader, “it is succeeding because the faculty want it to succeed” rather than any strong collaborative effort that includes support from both colleges in which it resides. Perhaps the biggest concerns of some of the engaged leaders with whom I spoke have to do with worries about H&S’s commitment to replace coming faculty retirements and address attrition, and with the uneven distribution of administrative responsibilities key to the program’s success, with the Franke College carrying the lions share. With the very large and growing undergraduate program, and dedication to advising and to maintaining faculty-student interactions, maintaining the overall faculty strength of the program is very important, as is supporting the program administratively. The Wildlife Program director indicated that there would be value in being part of only one College, assuming that College had a broad environmental/ecological focus and could be 100% committed to supporting its continuing success. Clearly, however, the program is successful despite the strains of being a joint program across H&S and Franke. Having its own endowment and development efforts probably helps.

Much more could be said about the strengths of these four programs. In summary, these programs are not completely overlapping and have different elements that are of importance to the university. Unfortunately, as I’ll discuss later, the new undergraduate programs that have recently proposed tend to ignore those differential strengths, driven explicitly by the desire to capture as many undergraduates in the majors and in the units’ courses as possible.

### ***Students***

Dedicated and committed graduate students are another great strength. From my conversations with them, many have chosen to come here because of MONTANA, but also because of great faculty and/or because of the reputation of some of the programs. Many said they had plenty of other choices but came here purposefully, despite knowing that they would likely experience limited graduate student funding and support (but some also voiced concerns that that can only go so far, an issue that I’ll come back to later). Most also recognize and appreciate the alumni and research-action networks that they have access to through their faculty mentors and programs.

### ***Staff***

Although I didn't have the opportunity to meet many at the departmental or program level, those I did meet are clearly dedicated to their students, proud of being at the University, and good strategic thinkers...and are highly frustrated at the recent emergence of overlapping and confusing undergraduate options and a competitive work environment.

I spoke with the new VPs for Marketing/Communication and Enrollment Management and Strategy – both very impressive individuals – and gathered that they share great enthusiasm for the university's strengths and opportunities in the area of environment and sustainability, but also share that concern about the inability to tell a clear story of environment and sustainability at the university and clarify opportunities and paths for students wanting to study and work in this area.

## Challenges

Most of the challenges that I heard are already known to leaders within the university. In sharing them with me, the faculty often preceded their criticisms with a statement along the lines of "he's a really nice guy, but..." or "I know they were trying to help, but..." or "I know that the university was in a bad place, but...." Perhaps this is another strength not mentioned above: most faculty (not all) were unhappy about decisions they didn't like but were not personally damning of those who made them. Nonetheless, there was plenty of finger pointing toward both 'the administration,' other programs, and individual faculty members (always unnamed).

It is apparent that many faculty feel that the environmental community has become siloed in recent years, most seriously in teaching and educational programs. Those who want to interact in research or serve on committees of graduate students in other departments can do so with only occasional, minor challenges. The problems arise primarily in undergraduate educational programs and teaching and are universally thought to be a consequence of the budget model (not just the new one being put in place now, but the one that has been in place for many years), made more difficult by declining budgets over the past ten years or so.

Attrition of faculty is evident in many of the H&S departments, including Geosciences, Environmental Studies and Geography. Because of the serious financial constraints faced by the college as undergraduate enrollment declined in the 2010s, their retirements and departures have not been replaced. Faculty and leaders in those departments say they have received very explicit messages (from previous H&S deans and provosts) that their existence is under threat, and that their only choice is to teach more undergraduates or disappear.

Linking departmental or program budget allocations directly to student numbers in majors and to student credit hours clearly sets up competition in a variety of ways, but that competition is especially challenging among units that have similar missions. As discussed above, Environmental Studies, Franke College units, Geosciences and Wildlife Biology all share a more-or-less common mission. With similar missions, these programs of course could be expected to develop curricula that are overlapping, but hopefully with distinctions. With competition for

undergraduates driving success or even survival of the unit, the overlap seems to be becoming even greater as programs seek to engage a broader group of undergrads in the major and more student credit hours in their courses. The result is not just severely overlapping curricula but repetitions in courses with similar content, inefficiencies in teaching, and confusion for students (as well as the student services staff and even faculty members who are supposed to be helping them find their way).

I'll use several examples to illustrate this, although other important ones exist (e.g., climate change program in the Honors College). The recent emergence of *Sustainability Science and Practice*, intended as a B.S. science-based undergraduate curriculum in Environmental Studies (with much of the science courses being provided by Franke College or other science faculty), is one such example; it seeks to compete for students with the Environmental Sciences and Sustainability major in the Franke College. Geosciences' new *Earth, Climate and Water* program (not yet launched) likewise explicitly was created to engage more undergraduates (although delivery of the curriculum rests almost entirely on the backs of a very small group of geoscientists, some of whom have said they are not clear on how it can possibly be provided to students). According to some individuals associated with these majors, they were developed quickly and with less careful curricular planning than desired, as a response to the pressure to capture students. And of course, one could say that the Franke College's *Environmental Science and Sustainability* program, when it was created earlier, competed with the Environmental Studies major in some ways (or at least with what EVST had been in earlier days, when more science faculty were a bigger part of the program). The development of these new competing majors is understandable, given the fact that success and even survival rest on undergraduate numbers. But what a shame! Instead of using a very careful design process to create distinctive, exciting, and unique programs that could complement each other and meet the specific needs of subsets of students, it seems that the opposite is happening.

Are there other challenges related to competition arising from the budget model? Faculty note that they are not encouraged (or allowed, in some cases) to co-teach, but instead must 'own' courses fully within their unit for budget recovery reasons; a great many also lament that they can no longer co-list courses (apparently because of administrative logistics more than anything else). These things lead to waste. Over the years, the university has gone to a lot of trouble to encourage the growth of a broad range of environmental expertise and perspectives across many disciplines and has encouraged the idea of collaboration in a variety of planning activities. Bringing deep knowledge and different perspectives together across disciplines is where the action is in innovative teaching...and yet the disincentives to doing so appear to be real.

As mentioned earlier, there are many individual faculty members and small faculty groups in different H&S departments and other colleges and schools who teach and do research about environment or sustainability issues as a *subset* of things the departments do. Some of these people appear to be very pleased with the level of interactions (especially in research), but others feel that they are not part of the broader community at the university. For example, some faculty members with whom I spoke noted that their environmentally-related major was not recognized, and they were not part of the environmental conversation on campus. They,

too, recognized that faculty are being incentivized to develop courses and curricula to increase enrollment – which one termed “academic hunger games.” Once again, the competition for bodies in seats seems to inhibit the kinds of interactions faculty members would like to have and that would be great for students.

This competition, to some degree, contributes to the situation raised by a number of faculty members – students in one college may not take advantage of relevant courses in other departments, even when those courses are designed to be useful and open to all students. Some of this problem may be inevitable, however, and would happen regardless of budget issues. Students may prefer to select courses in which the material being taught is being related to their area of interest or makes use of examples relevant to their interests. Additionally, it would not be surprising if students in forest management, as a hypothetical example, chose not to take upper-level economics courses in the Economics department, or students in ecosystem ecology chose not to take an environmental chemistry class in Chemistry, if doing so would require them to take four disciplinary prerequisites before having access to the class.

A number of Franke College and Wildlife Program faculty, including faculty directors of the educational programs, raised concerns about the fact that the budget model does not recognize the importance of small-group courses and field and laboratory learning experiences as part of excellent educational curricula. It seems that many of the faculty in the Franke College place great value on this and were concerned that the College budget allocations suffered because of it. It was suggested that this contributes to a situation where Franke College faculty are teaching more and spending more time on courses and advising than are faculty in other places in the University. This issue was raised in the ecology program planning activities of 2016, and apparently has been an issue in the Wildlife Program, where faculty from two different Colleges work together and apparently have different teaching loads. Not surprisingly, this is one of the issues raised and being discussed as part of the Franke College’s 2021 strategic plan.

Interestingly, this issue of uneven and unfair teaching loads and administrative duties is argued from both directions, with some in the Franke College claiming they have higher teaching loads than that in H&S departments (as noted above) while some H&S faculty suggest that *their* teaching and administrative loads are higher. No doubt there are considerable inequities, within and across colleges, for a variety of reasons, but they do seem to be causing resentments, at least among faculty who interact together in the environment and sustainability space. Likewise, there seems to be misunderstandings and opposing views on why these inequities are occurring, with some H&S faculty clearly believing that their college has suffered severe limitations in funding so that greater allocations could be made to the Franke College (and some other units), while some faculty in the Franke College appear to see it the other way around.

While the budget gets blamed for many things, it is not the only cause of the competition seen in the university. One other, I believe, may be related to historical roadblocks to change. I

suspect that most leaders who are trying to be change agents leading major change at their institution run into this issue, termed by one faculty member as “using historical structures as barriers to change.” If the university is hoping to organize itself in a way to make a difference for environment and sustainability challenges, it will need to mobilize as many perspectives, knowledge bases and approaches as possible, be willing to innovate, encourage new things and not simply protect the status quo. Based on my limited experience at the University of Montana, there may be programs that don’t want that to happen, implying that other programs do not have the capacity to ‘do it right.’ I think leaders at the University of Montana, as at other institutions, will have to address potential legacy and history-based roadblocks to innovation and growth in the university’s environmental and sustainability programs.

Other forms of distrust trust and lack of respect may also be a barrier to moving in new directions. Based on my conversations, it seems clear that a few of the Environmental Studies faculty don’t trust or respect the Franke School faculty or the Geosciences faculty, seeming to consider their research and educational programs unsuitable because they include resource management and use. Several Franke College and Geosciences faculty said they have been made to feel like they are part of a group of scientists “raping the earth.” One Geoscience faculty member said he felt ‘blackballed’ by some of the environmental community even though he was working on climate change, because he is from a department that has had research on mineral and energy resources. Their comments ring true to me, based on some things I heard in my conversations. Likewise, there seems to be some distrust and disrespect in the other direction: A few of the biophysical sciences faculty seem to view some EVST faculty as activists rather than scholars/educators and seem to be concerned about them promoting the “world according to them” rather than using evidence-based ideas in their teaching. Some are worried that Montanans will think all environmental science means environmental *activism* and worry that that perception will damage the reputation of UMT. And then there are the comments about ‘hard’ vs ‘soft’ science that cropped up everywhere (including among the graduate students) – something that I refuse to engage in – and which may be innocuous to some but are not helpful in the long term.

The very different unit standards in Environmental Studies vs the Franke College and Geosciences units are also a cause for concern on both sides. Indeed, the EVST faculty are concerned that, in any joint venture between their program and the others, the different standards would be used against them by the majority of the scientists and cause them to fail. This issue appears to be a big deal; I believe it would need to be addressed before any real partnership could occur between these programs.

Likewise, there is a tremendous lack of understanding about the content of the teaching and research done in other units (across colleges especially). One faculty member argued that the problem is that people in the other units don’t understand the meanings of specific words and use them incorrectly, causing confusion and apparent overlap. (Because I found myself wondering about and disagreeing with *that* faculty member’s definitions, the problem is likely real!) For example, some used sustainability to mean ‘environmental sustainability’ and some used it (more appropriately, to my mind) to mean sustaining the well-being of people

everywhere as well as their environment and resources. Similarly, it seemed to me that some individual faculty members were making outdated or incorrect assumptions about what was included in other departments.

While that lack of trust and respect toward individuals and units cropped up here and there and is definitely an issue of concern, there is a higher-level trust issue that permeates all the units with whom I spoke. Many of them seem to be exhausted by the visioning and planning and strategy development processes that has happened repeatedly, over multiple rapidly changing administrations of the past years and across colleges; some say those processes were encouraging and even exciting processes, but they led nowhere. I heard various forms of “Too much talk, not enough action” from many. They say quite clearly that they don’t trust that anything will come out of any such conversation as we’re having now. (I suggested that, in my experience, real change needs both bottom-up and top-down engagement and leadership, and that is something they may have now. I’m not sure it got through....)

And then there is the exhaustion of trying to do too much in the highly stressful and complicated world in COVID-times. One faculty leader noted that faculty are already overwhelmed with teaching, mentoring, and living in COVID-times and asking them to do more without relieving any of the pressure they are already under could be a problem. Another said that there are lots of great opportunities for collaboration that would be exciting to pursue but finding time now or prioritizing time makes collaborations difficult.

The graduate students (who I met separately from faculty) raised relatively few of the concerns raised by the faculty; they seemed to appreciate the engagements they were having with faculty, they loved what they were doing in their graduate programs, and they didn’t comment on barriers to cross-disciplinary connections. Several problems, however, were surfaced strongly by graduate students alone. First, several of the Franke College grad students (including several who had just moved with Geography faculty to the College) offered scathing criticisms of the College, especially around diversity and power sharing. They were very clear that the lack of diversity of faculty (and students) in the College was simply not acceptable; all of the students in the room agreed. In this discussion, EVST was pointed to as the only program in the area that included a Native American faculty member. At the same time, it was suggested that the Masters students in EVST tend to be white and relatively wealthy, as they are the only ones who could afford to do an unfunded graduate degree. Without a doubt, diversity and inclusion is an issue that must be tackled throughout the university.

The second problem that was raised by all three groups of students with whom I met had to do with student support. The Geosciences and Franke College students (groups which included both PhD and Masters students) raised concerns about graduate stipends, which they said failed to even pay their (now skyrocketing) rents let alone things like health insurance and food. They were concerned, too, that students receiving RAs were significantly better off than those on university funded TAs, causing both living hardships and inequities. Some students were explicit about the fact that they knew the financial situation they would face when they decided to come here, but they came anyway because of the great faculty and Montana. The current

housing situation is perhaps making them regret that decision (and it also, I imagine, threatens the ability to get great faculty). I asked the VP for Finance, in our short discussion, if the university was taking action to address the housing costs and availability challenges for grad students, staff and faculty alike; he said action was being taken. Some grad students suggested, however, that current actions to improve the faculty housing situation have made things even worse for some of them. For graduate students, there will likely need to be either subsidized housing or an increase in stipends, or they will simply not be able to afford the decision to come.

The financial situation described by the EVST students (who were mostly but not all masters students) appeared much worse. In an environment where faculty research is much more limited, RA-ships were not discussed. Instead, the students explained that many of them came expecting to be supported at least part of the time by a TA-ship, and that support failed to become available. Some were calling on family support, some working as well as going to school, some going into debt.

I did not ask the unit chairs or directors about their policies on accepting students without support; I assume such policies have been carefully considered by the faculty and chairs and deans. It seems, however, that the policies have not been accurately described to or fully understood by EVST students.

To summarize my sense of challenges, I believe that competition and confusion threaten UMT's ability to take the next step – or better yet, to leap-frog to a leadership position as a university that harnesses its broad and deep strengths to work for sustainability goals – i.e., for the well-being of people and their resource and environmental systems. Moreover, cross- program tensions, though completely understandable in this financial climate, could tear down much of the good will and collaborative spirit developed over the past decades.

## **Opportunities and Recommendations**

As noted earlier, the University of Montana has a very impressive number of faculty who work in a broad range of areas and topics related to sustainability. Although faculty outside the Franke College are widely dispersed across units, many with whom I spoke appreciate that breadth and value the peer-to-peer collaborations that they have been able to develop in research; many others would like more. Educational programs, on the other hand, seem to be largely competitive rather than collaborative, as colleges and departments compete for students to garner funds for their units. The emergence of highly overlapping undergraduate degree programs in sustainability areas reflects this fact. To students (and probably the outside world), it is hard to know what among the plethora of courses and programs makes most sense for them. For those attempting to tell the outside world what the university has to offer, the multiple narratives make for a complicated and confusing story.

Given this situation, how might the university build an environmental teaching and research effort that can be clearly articulated and a presence that is at least the sum of the parts, if not greater than the sum of the parts? I believe that the first option, below, is the best way to both address current problems and set the University up for leadership in the future.

## The 'Best' Option

### **Create a College of X (Environment, Resources, Sustainability or some combination thereof)<sup>1</sup>.**

I believe that by far the best option to fix the problems that leaders are concerned about is to put all of the core environment and sustainability programs together in one college or school. Many faculty members discussed what this could look like; some were highly enthusiastic about it, and some hated the idea (I'll talk about the negatives later). The reasoning in support of doing so goes like this: If the success of the different programs is not determined simply by the number of students they bring in, the programs could be designed to provide distinctive opportunities for students that complement and support each other and that best support student learning. Moreover, if needed faculty expertise is largely (though not completely) within the College of X and can be used to support more than one of those programs, efficiencies can be expected in terms of course offerings and engagement with students. With one college (and dean) responsible for the well-being of those programs, needed faculty and staff positions can be identified and prioritized to support the educational programs as well as research programs. Innovating, creating, supporting (with faculty, staff, and money), evolving, and when necessary, eliminating academic programs would be much easier. Finally, opportunities for marketing, attracting more students to the university, engaging new donors, and creating partnerships with entities around Montana and the world would be much easier, and the reputation of the University as a key player in this area much stronger. This College would garner a lot of good attention from students as well as citizens (and donors).

The College of X could make the University of Montana efforts greater than the sum of the parts. I envision it as a newly structured College that 1) starts with and builds on the Franke College components, which are already solutions-oriented and include a broad, multi- and interdisciplinary mix, and adds 2) the Geosciences Department, 3) the Environmental Studies Program, and 4) the Wildlife Biology Program. Faculty now engaged in those programs presumably would move with their billets to the new College, along with possibly a few other faculty whose interests align closely with the College. As a potential #5, it also seems to me that the Climate program now sitting in the Honors College would make much more sense in this

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<sup>1</sup> There are plenty of options for the name, and they will communicate different things to different people. My sense is that a "College of Environment and Resources" might be a good choice (especially for Montana), because it avoids the use of "environmental" and includes the implication that the unit cares about the resources people need as well as the environment in which they live. On the other hand, the term sustainability, if understood to refer to inclusive social well-being and not just environmental sustainability, could be more inclusive of things done in the university and may become more useful going forward.

new unit, where they faculty experts largely sit. I admit that I know little about it, but I usually conclude that programs are best aligned with the faculty and staff who teach in them. Beyond the Wildlife Biology affiliated faculty in H&S, there could be a 6<sup>th</sup> part; there appears to be a question about the appropriate home for ecologists and ecological graduate program in the Division of Biological Sciences in H&S. A number of faculty raised ideas stemming from a 2016 strategic planning process (the report of which I read) which explored the issues and recommended bringing ecology under one umbrella in the university. As they noted, ecologists are now distributed in departments in both H&S and the Franke College units as well as in programs like the Flathead Late Biological Station, and there may be real value to bringing them together to reduce inefficiencies and inequities and increase coordination and educational program delivery. While I did not learn enough to develop a strong opinion about merging the ecology community in a new College of X, this seems to me to be an important issue for leaders to consider.

With that combination of expertise and educational opportunities, the new College of X would be like nothing else in the country. It would provide cutting-edge environmental and sustainability teaching and research programs that are interdisciplinary, systems oriented, problem focused, and engaged with communities and decision makers of all kinds, embracing of issues of justice and inclusion, and seeking to build leaders.

#### College Organization

How would that College be organized? Some of the excellent educational programs in the first four units discussed above would probably need to shift towards greater complementarity. Environmental Studies, for example, could potentially become a BA concentration in a larger program such as the Environmental Science and Sustainability Program. Others (especially the newest ones like EVST's *Sustainability Science and Practice* and Geosciences' *Earth, Climate and Water*) that have been motivated by competition should be set aside until they can be rethought and reorganized to fill specific and complementary needs.

Beyond the educational programs, faculty 'homes' (departments or programs) would need to be rethought. While some would likely look similarly to what they are today, some could be partly or wholly new combinations of faculty expertise and could be very exciting. Hopefully all would have low walls, allegiance to the X College as a whole rather than their narrow units, flexibility that allows different kinds of cross-unit faculty engagement, and room for growth and change. It is clear from my conversations that there are multiple ways to organize faculty, especially as new and different expertise comes together, and that at least some of the faculty are already thinking creatively about that (see the *Idea Box*, at the end of this report).

Some of the wonderful array of "field stations" accessible to the university and its students also could be closely linked with the College, potentially making the relationships stronger and opportunities more evident for all parties. For example, the PEAS Farm is a tremendous asset for the university and has been enthusiastically supported by Environmental Studies, but financial support for the Farm has been quite limited and uncertain. The PEAS Farm partnership (with the external NGO Garden City Harvest) could be highly valued and supported

more thoroughly by a college that prioritizes environment and resources efforts (and which could also, potentially, add more faculty in food systems to fill an important university gap). Engagement with the Flathead Lake Biological Station, likewise, could be broadened, providing exciting opportunities for the College, University, and Field Station more broadly. These and many other ideas bubbled up during my conversations; I've listed some others in the *Idea Box*.

Having a strong College of X could also allow the university to invest more directly and easily in gap areas -- missing or under-represented areas of knowledge and expertise. Clearly, investment in areas that are essential to the state and the world -- such as climate change impacts and responses (including the science and policy of mitigation and adaptation); energy futures; and food systems -- could put the university in a better place to contribute to societal issues and could strengthen the research in and impact from other areas of expertise already in the university.

The College of X would also increase the opportunity for the university as a whole to engage strongly in new educational relationships and partnership opportunities with Native American communities. With the help of the Environmental Studies program's experience, the College could provide both faculty and students opportunities to value and understand traditional knowledge; its co-engagement with Western knowledge where it makes sense; 'engaged research' or transdisciplinary research (defined as collaborative approaches for the design and implementation of research activities and outcomes that are intended to assist decision makers of all kinds in solving challenges); or other opportunities to engage with and learn from the Native American and other diverse communities in the state and region. Most universities are struggling to engage in these areas today; the University of Montana could lead.

#### Add a Cross-Campus 'Collaborative'

But what about all those other units around the university that do not have environmental programs as their main missions, but do have individual faculty who do research and teach on environment and resource issues, and who may offer minors and certificates on those topics? This question has not been raised for me by university leaders, perhaps in part because major budgetary issues do not arise from it. That said, some of the faculty engaged in them have indicated that they'd like not to be isolated and want to be recognized as part of the university's efforts. If there is to be a new College of X, what should happen to them? If Journalism has a certificate program or minor in Environmental Journalism, should it move to the college? If Chemistry has an environmental chemistry major, should it move to the college? It is possible that some of the individual faculty members spread around campus would feel equally or more at home in College of X than in their original home. For them, it seems reasonable to have an option for them to join (although I recognize the billets and dollars for these faculty could be an issue to resolve!). For most faculty, however, their best home would likely remain in their disciplinary department, where they contribute broadly to the discipline as well as to environmental interactions.

Given that broad and dispersed community, I believe there might be benefits to creating an additional entity (preferably associated directly with the College of X) to provide a collaborative home for faculty all over campus, providing them a low-effort opportunity to learn what each other is doing, develop collaborations in research and teaching, share knowledge and innovative ideas, and build a social network. In other words, it could provide an intellectual coming-together place for all faculty (inside and outside of the X College) who desire to be part of something bigger. (At some point, a building for the College could also provide a physical coming-together place for the broader community.) This community collaborative -- called, possibly, the Sustainability Collaborative or the Institute for X -- could play several roles. For example, it could provide small funding opportunities to support planning and design meetings for interdisciplinary research ideas or seed money for exploratory projects. Experience in other universities has shown that small dollars at the right time pay off in increased extramural research dollars and societal problem-solving over longer terms. It could hold public lecture series and quarterly social gatherings, both building the university community and making the university's efforts more apparent to the state. It could become a "boundary-spanning organization" that assists faculty members and students in finding non-academic collaborators and partners. Such a Collaborative could theoretically be supported as a cross-college endeavor, but my experience tells me that it would be best managed out of the College of X, on behalf of the whole university, hopefully with support from the Provost (with VP-R and VP-F). Having two university entities that appear to have the same mission but have separate administrative and fund-raising mechanisms, would almost surely lead to more, and worse, competition and confusion.

### Barriers and Challenges to the College of X Idea

What about the barriers and challenges noted in the previous section? What about cultural differences, distrust (of each other and the administration), or historic roadblocks? As we discussed the idea of a new college or school, the faculty, staff, and students that I talked with raised a number of themes that call into question the viability of building one new College.

- 1) Exhaustion. There was quite a bit of eye-rolling and groaning at the thought of creating or restructuring a new college. As one faculty leader said, we're all just too exhausted. (I note that he was a senior faculty member close to retirement; being so myself, I can understand his point.) Many of the faculty have willingly or unwillingly engaged in other strategic planning activities before (indeed, the Franke College is in the midst of implementing its 2021 plan right now) and not surprisingly, many are hesitant to have to do it all over again. Moreover, COVID has taken its toll, and energy may be low.
- 2) Distrust of power and control, with the fear that "moving" into the Franke College (assumed to be just as it is today) would result in lost ability to determine one's own research and educational future. 2A) Most faculty in Geosciences assumed that moving into the Franke College meant being shoe-horned into other departments, losing their own disciplines, and losing their ability to train graduate students. They rightly noted what happened to Geography once they were moved into the College. When we together started imagining an exciting new unit (described in the Ideas Box), there was, I

think, more optimism. 2B). Environmental Studies, likewise, feared that they would over time simply disappear if they moved into the College. Our conversations never went far enough to imagine what their structure might be like if they were in the College, but I believe it was unspoken that they would want to retain their identity (which, as I noted earlier, varies depending on which faculty member is describing it.)

- 3) Mismatch of academic culture. Environmental Studies was highly concerned about the culture of the College, noting the 'hard science' culture, the fact that the expectations for faculty members and unit standards are quite different between the two units, and that their engagement in 'training activists' (which I interpret as mostly 'training change leaders') would not be acceptable. This concern about cultural mismatch was present, I was told, in discussions between Environmental Studies and Geosciences as well.
- 4) Misunderstanding and disrespect of each other. As I discussed in the 'Challenges' section, I encountered clear examples of distrust and disrespect on the basis of which department or discipline one was in, assumptions of un-ethical research goals, and concerns about 'difficult personalities.' This occurred relatively infrequently, but of course those attitudes have the potential to make life very difficult for a community trying to come together.

These are all important challenges to the idea of creating one college comprised of the faculty, staff, students and programs of the Franke College, Environmental Studies, Geosciences and Wildlife Biology. I believe these challenges could be overcome, with great benefit for the university, if the higher administration wanted it to be done. Doing so would require a clear statement of support from the President and Provost, a considerable amount of finesse by the Dean, and a very carefully constructed change process with investments in design workshops and facilitation as well as implementation, along with insistence on a respectful, collegial, collaborative process.

My sense is that exhaustion (#1) can be overcome for most faculty (except perhaps those who are ready to retire), especially if the process can be one that is exciting, fun, and ultimately likely to be very rewarding. It'll take money to do that well. Distrust of power (#2) will go away, largely, if the Franke College commits to a rethinking and restructuring process that includes its own units. If it does not, this probably won't work.

The mismatch of academic cultures (#3) and misunderstanding and disrespect (#4) are very real and very difficult to deal with. In the Franke College strategic plan, I noted that the College is already in a discussion about adding flexibility to the unit standards to recognize that some faculty are more dedicated to teaching than research, and vice versa, so some progress may already be made. The misunderstanding between units is something quite understandable; humans tend to categorize, group, and then define others on the basis of earlier assumptions about the group. Education and time together can help. But for some, disrespect has been ingrained and is hard to give up. Disrespectful behavior can be dealt with directly, and those who continue in it can be isolated from the whole!

I'm an optimist, and I believe these challenges can be addressed, but it will take a lot of work from all parties and very good leadership. I've heard from many faculty, staff and administrative leaders that Dean Townsend is a great -- some even said "a transformative leader." (My experience tells me the same.) In addition, I believe there are several additional excellent leaders within other units who can help.

## Other Options

What happens if the challenges of building a College of X as described above are perceived as too difficult to tackle, or if competitive juices prevent creation of such an exciting unit, or if legacy donors stand in the way, or if other legitimate barriers that I don't know about prevent action toward its creation? As I talked with individuals and groups over the past weeks and asked them for their ideas about opportunities for the university as well as for them as individuals and academic units, virtually everyone had an idea. Most wanted to change the budget model, of course. Some of the units wanted to have their lost faculty billets returned and refilled...and then be left alone. A few others thought there could be a new school of some kind shared across colleges. And lots of faculty members and groups explored the idea of building a new or restructured college of some sort, as discussed above. In this section, I'll discuss some of the alternative options, recognizing that my weak understanding of the university's way of operating may make some of these non-viable.

**Change the Budget Model:** For most faculty members, this was the first option that came to mind. I understand their reasoning; I have seen first-hand (in my various university reviewer and leadership roles) how the RCM budget model can make cross-campus interdepartmental and interdisciplinary programs and projects very difficult.

In contrast, let me use an example of a university that I know well that does not use a RCM budget model. Stanford has long been recognized for highly successful interdisciplinary programs (both educational and research); these IDPs are successful in large part because it is budgetarily easy to support them. No indirect cost recovery nor tuition dollars are allocated directly to academic units strictly on the basis of numbers; instead, funds all go to the provost and the provost allocates them based on need and opportunities for innovation as well as contributions to the university's teaching and research missions. This removes disincentives for faculty to teach together, create and support educational programs together, and do research together across school boundaries. (Incentives also accrue -- including the fact that many of us think it is a lot more fun and also impactful to do research and teaching this way.) It means that some departments may be well-supported even if they have no undergraduate program (and indeed, many contribute their teaching and advising to interdisciplinary programs instead of hosting their own departmental program.) It's not perfect, of course, but it works. As far as I know, there are few universities who do this, and I can well understand that it may not make sense for the University of Montana. That said, there may be ways to modify the current budget process to support interdisciplinary endeavors through the use of different metrics.

### **Add Geosciences to the Franke College (with no College restructuring)**

This option has only limited benefits. It will address budget concerns in H&S and add some important strengths to the Franke College, but it likely would cause unhappiness and possibly departures among some very good people in geosciences, to the detriment of the Franke College research and teaching programs as well as others. More importantly, it would do nothing to reduce some of the most serious conflicts and competitions with EVST, nor would it help put the University on the map as *the place* for environment, resource, and sustainability efforts.

### **Create a New College of X with Franke College Units and Geosciences, but not with Environmental Studies**

This idea would produce useful benefits and may be relatively easier to do than the “best option.” It is a lighter lift because many of the culture and some of the distrust issues would likely be lessened. As with the ‘best option,’ it would be important to relabel, rethink and restructure the Franke College, engaging the new incoming faculty along with Franke College faculty in doing so. This would set the College on a path to becoming something much broader and more apparent than it is today, something that the University could talk about, market, and develop donor resources to support, and it would reduce some part of the competition around educational programs. On the other hand, it would not fix the largest problems of confusion and competition around environmental science and environmental studies programs, at least in the near term, and it would also make it more difficult to market the College as the focal point for environment, resources, and sustainability at UMT.

### **Leave the Environmental Studies Program in H&S (with its current areas of strength)**

In talking with the *Environmental Studies Program* faculty singly or together, I found myself getting very confused about who they actually are. Their narrative about themselves seems to shift depending on the speaker. I got the sense that, for some (especially some of the senior faculty who helped create the program), their vision of the program no longer matches reality. This is in part because they have lost faculty in some areas (e.g., ‘environmental sciences’) but it may also arise in part because some of the newer faculty are pushing the program in new directions, giving less emphasis to biophysical and social sciences and more emphasis to environmental ethics, literature and journalism, Traditional Ecological Knowledge (TEK), Indigenous rights, environmental justice...and to activism. I believe that these areas of scholarship and action are important directions, and I believe that scientists (of any sort) would benefit greatly by increased knowledge in those areas. Integrating this kind of academic program into the new College of X could be beneficial to many students, bringing ways of thinking and doing that could permeate the whole endeavor.

If, however, EVST remains in H&S, I believe care will have to be taken to consider its form. What about rebuilding EVST to what it was in the past, an option that some of the faculty desire? This does not seem to be a sensible option to me, due both to budget constraints and overlap with what the Franke college is doing now (and the competition and confusion that goes with that). Could EVST instead continue its apparent shift toward a focus in the humanities,

which would distinguish its major from the Environmental Science and Sustainability major, and if so, would it reverse the declining number of majors?

Could there be other opportunities for EVST under some kind of rethinking of H&S? Possibly the *Environmental Studies/Humanities Program* could be revised as a cross-department humanities and sciences program, taught by faculty members in those departments and programs. Among these other options, I don't know which option is best...but it seems to me that some clear decisions are needed sooner rather than later.

Based on my reading of the program and my understanding of the motivations for creating it, I believe the newly approved BS in Sustainability Science and Practice Program is not helpful. The scientific part (required for the BS) is mostly taught with other departments' courses and is competitive with degree programs taught in those units. Moreover, it is hard to understand the goals of the program; the design elements utilized in its creation are not clear, at least based on what I could see. It makes sense to me to delay this new degree program so as not to muddy the waters more and also not to forego opportunities for a really important, carefully designed sustainability program in the future.

#### **Continue the Wildlife Biology Program As-Is?**

If the new College of X is created, it may make good sense to move the Wildlife Program totally into it, especially if engaged faculty in the Division of Biological Sciences either moved to the new school or were allowed to remain active in the Program. The Franke College already provides most of the administrative support and much of the faculty support for the Program, and the new College of X would have many incentives to keep the #1 program strong and to keep investing in faculty lines to support it, even as senior faculty retire. Moving the program to a single, committed College might reduce complexity and risk. Moreover, as the new College of X expands its course offerings, some of the kinds of course offerings discussed above or shown in the *Ideas Box* could be very important to the Wildlife students. As the director said to me, increasingly, students need to know about things like leadership skills and conflict resolution, not just biology.

Is it essential to change the way things are done in the Wildlife Program today? Obviously, the joint program is working now, at least from the point of view of students and faculty. Faculty in both Colleges teach in the program and seem committed to it, and the program would be weakened if that were not the case, at least in the short term. However, the Franke College is clear about the challenges they face as they provide most of the support for the shared program; from their perspective, it does not seem to be working well, at least in administrative and financial terms. It seems that, if this program is to remain a shared program between the two Colleges, the issue of shared support will have to be addressed.

#### **Bring Ecology Programs under one Umbrella in the new College (or School) of X**

What about the programs in ecology? As noted earlier, there has already been considerable support and planning around the idea of bringing ecological expertise together, presented succinctly in the 2016 Ecology Programs and Organizational Review. I was not able to focus

much attention on this question as it relates to the situation today, so do not have a strong opinion. It seems to me that many ecologists would have very strong affinity for and comfort in a College or School of X, but others may have closer affinities with other parts of the Division of Biological Sciences. Does it make sense to resurrect the recommendations of the EPOR committee report, or has the situation in the university changed too dramatically to make that plan sensible today? Do the benefits outlined in the 2016 report still stand? I recommend that leaders consider this carefully with the ecology faculty.

### **Create a New School of X Shared and Administered by the Franke College, H&S, and others**

This was suggested by only two people. As I understand the suggestion, it would draw together some of the scattered H&S expertise with the Franke College expertise to create a new cross-college entity. Possibly some of the faculty from H&S could choose to do fractional appointments split between the School and their original home departments (although I didn't get the impression that a lot of them would want to do something like that). Perhaps the small and declining Geosciences department and Environmental Studies Program would do 100% appointments. The Franke College would presumably bring all its strengths; if it didn't, there would be huge competition and confusion. With a reorganization and rethinking of degree programs and courses, H&S's small and declining department problem would go away, its current budget deficits could be reduced, and presumably it would get to share future budget allocations with the Franke College.

To me, this model makes little sense when one of the partners is already a successful college with significant strengths totally focused on environment, resources, and sustainability. Either the 'shared' School *or* the Franke College would need to be *the place* for environment at UMT; both could not be. Given that the Franke College is the closest thing to that right now, I'm not sure what would be gained for them in this deal. If, for some reason, a new School is the right structure, I believe it would be best for it to be included in or include the Franke College in its entirety.

### **Conclusion**

I think that a new College (or School) of X – of Environment, Resources, Sustainability, or some combination of all three, built on the strengths of the Franke College and the other smaller units discussed above, possibly along with a 'Sustainability Collaborative,' would be a bold move that would put the University of Montana on the map. It would set up the conditions for innovation and implementation of new ideas, send a very clear signal for undergrads and graduate students considering their options, potentially attract new donors and funding, remove, or reduce conflict and distrust, and increase the contributions that the University of Montana can make to the state, nation, and the world.

Many thanks, again, for the invitation to comment. Please call on me if I can help more.

Best wishes,  
Pam

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## Idea Box

### **Change Leadership Training - A new educational offering**

Many people noted the need to train people who can lead change despite complexity in the real world. The College of X could have a great opportunity to increase education in this area via courses, certificates, masters, and professional education. At Stanford, for example, we offer a co-terminal MS/MA program (called *Sustainability Science and Practice*) that has grown incredibly quickly and includes students from all undergraduate degrees. The program, which is essentially a professional masters that includes a practicum, is designed to build students' identities as leaders and change-makers, and provide them with the mindsets, knowledge, skills, toolkits they can apply every day, in any career or career stage.

Elements of the program include:

- Understanding Complex Systems - Recognizing the dynamic nature of human-environment interactions, including the feedbacks, trade-offs, and unexpected consequences intrinsic to highly complex systems
- Understanding Decision Making and Strategies for Leading Transformative Change - Understanding organizational and individual behavior and how to accelerate new models and approaches that align business, NGO, and governmental actions with sustainability
- Designing Innovation with Impact at Scale - Possessing creative confidence and know-how to harness design and systems thinking to innovate for beneficial change locally and also at large scales

### **Earth System Science<sup>2</sup> – A new interdisciplinary department**

Create a new department that includes foci on Earth's global and regional land and water systems and that could include hydrology, climate science and policy, oceanography, atmospheric sciences, geography and planning, food systems, energy systems, ecosystem services, resource economics, data science, and many other areas related to the emerging issues of Earth systems rapidly undergoing change. This could be a remarkably flexible department that could allow hiring of new and critical areas over time. It could also be a good home for most of the geosciences faculty as well as others already in the Franke College and EVST.

### **Joint degrees with Business and Law**

A joint degree program for students already in Business and Law (and maybe Health) programs, to gain depth in important science and technology areas in which they may work.

### **New undergraduate 'catcher courses' or gen-ed courses**

Develop introductory courses that would introduce incoming students to some of the great faculty and areas of environment and sustainability interest in the University. One such course could be a "catcher course" meant to provide a broad introductory education about some of Montana's and the world's most critical issues and at the same time introduce and entice freshmen to join the College's majors or other educational programs. The course could be built

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<sup>2</sup> See the recent National Research Council report titled 'Next Generation Earth System Science at the National Science Foundation.' <http://nap.edu/26042>

around one-hour intro- or public-lecture style lectures by two dozen of the most engaging faculty speakers working in the area of environment, resources, and sustainability, covering a breadth of issues across social, biophysical, humanities and engineering areas.

### **Professional education programs and degrees**

On-line and in-person courses or programs or short audio books that focus on or introduce audiences to Montana's landscape, geology, forests, rivers and lakes, wildlife (and could be attractive to National Park visitors), on-line short courses, certificate, master's degree programs, etc.

### **An Interdisciplinary PhD Program**

Many faculty noted that it is important to be able to train PhD students in specific knowledge areas (e.g., ecosystem ecology, conservation biology, forest management, hydrology, and water resources), but some also noted the desire for a truly far-field interdisciplinary Ph.D. program that allows students to become expert in and combine knowledge from more than one area. Such programs draw a special kind of student who tends to be highly motivated, often with more professional experience than most graduate students and a clear understanding of why they should engage in such a challenging program. There appears to be significant demand for this kind of program; at Stanford, we accept only about 5% of an excellent bunch of applicants to our interdisciplinary Ph.D. Program each year. With the breadth of expertise at UMT, this could be a fantastic opportunity.

**End box**

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