



University of Colorado Boulder

2022 Program Review

University of Colorado Museum of Natural History

Academic Review and Planning Advisory Committee Report

Approved

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Process Overview

The Academic Review and Planning Advisory Committee (ARPAC) review of the University of Colorado Museum of Natural History was conducted in accordance with the 2022 program review guidelines. Self-study responses were prepared by the unit, submitted in December 2021, and checked by two ARPAC members specifically assigned as liaisons to the unit, as part of the discovery process. The ARPAC unit liaisons submitted a summary of findings derived from the self-study and from interviews and/or surveys with faculty, staff, and student unit members. An external review committee (ERC), consisting of two experts from outside of the University of Colorado Boulder, engaged in a virtual visit and submitted a report based upon review of relevant documents and meetings with faculty, staff, and student unit members and university administrators. ARPAC staff, employing web conferencing tools, facilitated the external review as a remote visit over March 7 and 8, 2022. ARPAC reviewed and considered these materials, met with the dean of the institutes, and wrote this report. Discovery process summary and external reviewer comments and recommendations are shared when relevant throughout this report.

Past Reviews

The Museum underwent its first program review in 1985 and was last reviewed in 2015. ARPAC has consistently noted the inadequate physical condition of the facilities and the lack of space for collection storage, offices, labs, and exhibitions. Despite some improvements, these issues have not been fully resolved after repeated cautions raised across the 1985, 1992, 1999, 2006, and 2015 reviews.

An interim director currently leads the Museum after the retirement of the previous director, who led the unit between 2008-2022. Prior ARPAC recommendations suggested hiring a director with fundraising experience and attracting more school groups.

This review concludes with recommendations for immediate and long-term sustainability. Critically, the Museum must communicate its value to the university community and the public. To achieve this, the report recommends adopting a strategic plan and promoting it effectively. Developing a realistic and actionable plan for the future is crucial. The new director will have a significant role in this effort.

Unit Overview and Analysis

The campus' standardized description of the University of Colorado Museum of Natural History is available on the website of the Office of Data Analytics (ODA) at <https://www.colorado.edu/oda/institutional-research/institutional-level-data/information-department/academic-review-and-planning>. ODA updates the profile annually in the fall semester. This report cites data posted in October 2021, reflecting the state of the Museum as of the academic year (AY) 2020-2021. It also cites data from the unit self-study, as described below.

Disciplinary Context

The University of Colorado Museum of Natural History is a robust and internationally respected museum with a strong teaching mission. It is also, to quote its self-study, "in a rapid period of change." Despite this transitional period, and despite significant infrastructure challenges discussed below, the external review committee (ERC) called the Museum an "outstanding resource for CU students, researchers in the CU and international research communities, and members of the public in the state of Colorado."

As previously noted, the unit currently has an interim director while undergoing a national search for a new director and will be hiring a new assistant director and public section staff positions in the coming years as well. The Museum's leadership is primarily staffed by faculty whose tenure homes are in a

number of disciplines within the College of Arts and Sciences (e.g., Anthropology, Ecology and Evolutionary Biology, Geological Sciences). All curatorial positions are filled by faculty.

Professional and collections staff fill out the key support and operational roles of the Museum, including the management of collections. The Museum also has a seven-member advisory board made up of members from CU Boulder as well as the larger community.

The Museum is accredited by the American Alliance of Museums. The original accreditation was in 2003, and its most recent reaccreditation came in 2019. Like the research institutes, the Museum falls under the administration of the Research and Innovation Office (RIO).

Research and Scholarship

The Museum's faculty and staff are considered leaders in the field, and the external reviewers made a point of praising the Museum's faculty as being outstanding. Specifically, they noted the Museum has hired top faculty nationwide into the teaching and curatorial positions and pointed out that the faculty's research productivity engages students as well as Museum research personnel.

Museum faculty have had their scholarship published 400 times since the 2014 review, a marked increase from the 2007-2014 review cycle, during which they were published 243 times. According to ODA, faculty and other Museum research staff have produced an annual average of 0.7 refereed books and monographs, 0.4 edited books, 34.2 refereed articles and chapters, 19 conference papers and presentations, and 6.6 creative works. Aside from conference papers, this performance ranks the Museum's faculty and research staff among the top one or two units in the current review cycle and in the top 20 campus wide.

For its self-study, the Museum used Google Scholar to evaluate the impact of faculty research. That evaluation revealed that during the current reporting period, Museum faculty were cited 33,539 times, a significant increase from the 10,533 citations recorded in the previous reporting period ending in 2014. The H-indices range from 6 to 52, with a mean H-index of 23.5, compared to a range of 3–39 and a mean of 15.6 in 2014. The lower numbers are affiliated with the most recent hires, who have not had the time to develop their research impact. Additionally, graduate students and other Museum research staff are listed as being productive. Recent publications have appeared in such top-tier journals as *Science*; *Nature*; *Proceedings of the National Academy of Sciences*; *Ecology Letters*; *Trends in Ecology and Evolution*; *Ecology*; *American Naturalist*; and *Palaeogeography, Palaeoecology, Palaeoclimatology*. Museum faculty are also in demand for seminars and invited presentations, delivering 122 invited presentations since the last program review.

The Museum has experienced a surge in funding from external sources. Over a five-year period ending in 2021, grant expenditures amounted to \$1,266,000, representing a 59% increase from the preceding five years. Over the current reporting period, the Museum received 41 grants totaling over \$5.2 million that were directly related to collections, including research and conservation.

ARPAC expressed concerns about a lack of clarity in the self-study regarding the portion of faculty salaries financed through general university funds versus other funding sources. Unfortunately, because the Museum's finance/human resources position is currently unfilled, the interim director was unable to provide that breakdown.

Collaborations

Museum faculty and staff collaborate with 250 institutions worldwide, including academic institutions, other museums, and Native communities. The Museum's self-study report highlights three programs as examples of these collaborations. Firstly, the "Bees Knees" program, which provided bee nesting blocks to communities across the state. Secondly, the "CU South Denver and Family Fun Days" program, in which the Museum shared its exhibitions and organized events for CU South Denver in Parker. Lastly, the "Mesa Verde Community Education Program," a partnership with Mesa Verde National Park that facilitated classroom education kits, enabled CU student workers to create educational activities, and developed education programs that were showcased internationally. Outside collaborators on these and other programs include: Transition Colorado, the Longmont Public Library, the Colorado Chapter of the Alzheimer's Association, City of Boulder's Open Space and Mountain Parks, Boulder County Open Space, and the Americas Latino Festival.

In addition, the Museum collaborates with many campus academic and research units, including the Departments of Art and Art History, Ethnic Studies, Spanish and Portuguese, and Theatre and Dance; the Anderson Language and Technology Center (ALTEC); the College of Engineering and Applied Science (CEAS); the University Libraries, the Cooperative Institute for Interdisciplinary Research in Environmental Sciences (CIRES), the Institute of Arctic and Alpine Research (INSTAAR); and CU Science Discovery. The self-study cites CU Science Discovery as being especially beneficial in outreach, developing three classroom presentations that have served over 5,000 students statewide.

During the current reporting period, approximately 550 researchers visited the collections from CU, Colorado, across the USA, and internationally.

The external reviewers praised these collaborations and noted that extending collaborations both on campus and with external entities could help the Museum achieve some of its long- and short-term goals for the future.

Campus Context

The Museum has two distinct educational functions: teaching graduate and post-graduate scholars (such as via the Master's of Science in Museum and Field Studies, the Professional Certificate in Museum and Field Studies, and postdoctoral supervision) and preserving, exhibiting, and collecting artifacts related to the region's natural history. It does not offer an undergraduate degree or courses. The Museum sees these educational activities as being closely tied to its research mission. More than 5,000 people made use of the Museum collections during the reporting period, including 2,449 CU students (either individually or through class tours) and approximately 2,800 public visitors, though personal visits to the collections or through use of the collections in outreach programs run through the Museum's Education Section. This is in addition to those members of the public who visit the Museum itself annually to view its exhibits.

In addition to its educational roles, the Museum has a strong commitment to public education, specifically through programs aimed at K-12 students. The Museum's success in this regard was highlighted by the external reviewers who pointed out several programs, including the GAMES project, which focused on encouraging girls to pursue STEM education, and various traveling education programs. These programs were commended for their innovation and effectiveness and were cited as prime examples of the Museum's outreach initiatives.

Like many other museums, the CU Boulder Natural History Museum, faced distinct challenges during the COVID-19 pandemic. In-person visits and other activities were impossible during much of 2020 and

2021. During this time, the museum focused on updating its in-person exhibitions and also turned to a series of digital exhibitions and virtual exhibits to fill the gap. The external reviewers note that this innovation, done by necessity, revealed that there is a desire for people who cannot physically visit the museum to explore its collections. The reviewers noted that the exhibitions that provided outreach to the Latinx community via Spanish-language modules were among the most heavily used by virtual audiences.

Strategic Vision and Planning

The Museum does not have a current strategic plan; the unit recognizes the need for a plan but believes it should be designed with input from the new director. However, the unit did an internal survey and identified key issues the Museum will need to address in the near future:

- Update the Master's of Science in Field Studies program, including updating learning goals
- Develop innovative and modern exhibits
- Address space and infrastructure needs to adequately protect and display the Museum's collection
- Undergo team building to make members of the community feel valued
- Address salary inequity
- Hiring to reach full staffing levels
- Invest in technological infrastructure
- Obtain financial support from the University to achieve these goals

The external reviewers agree that a new strategic plan should await the appointment of the new director, but stress several other issues that will need to be addressed in that plan, in addition to those mentioned by the unit:

- Prioritize facilities needs in a triage fashion, to mitigate the potential for systems failure damaging the collections
- Reset the Museum's relationship with Advancement to clarify the roles and responsibilities of each in setting and achieving major fundraising goals
- Reevaluate the role and purpose of the Museum's Advisory Board

Governance

The Museum is headed by a director who reports to the vice chancellor for research and innovation (RIO) and dean of the institutes. An assistant director position exists but is currently vacant due to budgetary considerations; this position oversees the Public Section of the Museum. The faculty director of the Museum and Field Studies Program is the third position on the leadership team of the Museum.

The Museum's bylaws were last revised in 2005. The bylaws define Museum faculty members as consisting of four categories: (1) the primary unit, which is the rostered faculty, the director, and all others holding appointment in the Museum as professors, associate professors, and assistant professors; (2) emeritus faculty; (3) associated faculty, which includes those persons serving without compensation from the Museum and holding faculty titles as museum associate curator, museum curator adjoint, and museum associate; and (4) attendant faculty, visiting faculty of any rank, instructors, and senior instructors. Curiously, and not desirably, the bylaws imply that instructor-rank faculty are not considered part of the primary unit, even though this is irrelevant as the Museum currently has no instructor-rank faculty. Unusually, both faculty and staff have voting rights in unit meetings; however, matters such as curriculum, which are the responsibility of faculty only, appear to be handled by committees rather than voted on during unit meetings. The bylaws provide for three

standing committees, including the Project Committee, the Committee on Museum and Field Studies Curriculum, and the Committee on Collections, and also stipulate that ad hoc committees may be appointed by the director.

The Museum has established criteria for primary unit appointment, reappointment, promotion, tenure, and post-tenure review of faculty. These criteria are attached to the bylaws and outline the responsibilities of both the Museum and the cognate department in each of these processes. Since all Museum faculty are jointly appointed with a cognate department, these criteria serve to define the roles of both entities. It is not known when these criteria were last updated.

Another appendix to the bylaws describes the annual merit review process, which is undertaken by a committee comprised of two tenured faculty members (voting members), one untenured faculty member if one is available (non-voting member), and the director (non-voting member, unless a tie vote must be broken). It is not clear when this document was last revised. The standards for rating faculty members' teaching, research, and service are not defined in this document. The external reviewers identified this lack of definition as a shortcoming within the unit, especially as it pertains to the annual evaluation of faculty members' curatorial duties.

The self-study provides no indication of a faculty mentorship program or the availability of grievance procedures for faculty members. However, the grievance procedures for graduate students are in line with those established by the Graduate School.

In general, it appears that the Museum's governing documents require a comprehensive review and update. Among the missing items, ARPAC believes that protocols for annual merit review, faculty mentorship, and faculty grievances are the most urgently in need of immediate attention.

Inclusive Excellence

According to the AY 2020–2021 ODA Museum profile, 58% of the unit's tenure stream faculty members identified as women and 9% identified as non-white, with none identifying as belonging to underrepresented¹ racial/ethnic groups. The self-study, submitted at the end of 2021, notes that two faculty members were non-white, a result of an additional hire for AY 2021–2022. This represents a decline in diversity metrics compared to the AY 2016–2017 ODA unit profile that showed 64% of the tenure stream faculty members identified as women and 20% as non-white.

Of the students in the Museum and Field Studies master's program, 79% identified as women and 14% identified as belonging to an underrepresented racial/ethnic group, according to the ODA unit profile for AY 2020–2021. It is worth noting that all the students who identified as Black, Indigenous, and people of color (BIPOC) also identified as members of underrepresented minority groups. In comparison, the AY 2016–2017 ODA profile showed that 93% of graduate students identified as women, 14% as non-white, and 7% as members of underrepresented minority groups. The self-study notes a more diverse applicant pool and entering class of graduate students "over time," but the accompanying table demonstrates that the increase in diversity really applies only to the entering class of 2021. ARPAC hopes that this increase does prove to be a positive trend "over time."

¹ ARPAC notes that it can sometimes be complicated to have consistent, shared terminology for protected class identity groups. In the context of this report, we use the term "underrepresented" to refer to individuals or groups that have been historically marginalized or minoritized within U.S. higher education. Although national data sources often use the term "underrepresented minority (URM)" to combine people who are Black, Latine, and Native American, ARPAC acknowledges that the term "minority" is contested and diminishing.

The Museum’s self-study notes a number of efforts to improve the diversity of its faculty hiring and graduate applicant pools, including expanding the scope of advertising (for both groups) and, for graduate students, eliminating the requirement for GRE scores. Overall, the Museum has sought to become a more welcoming community for faculty, staff, and students from diverse backgrounds through such efforts as anti-bias training, more internal and external programming focused on issues related to inclusivity and diverse communities and working with K–12 students to encourage interest in STEM fields at an early age among female and underrepresented students.

The Museum also highlights the connection of its research and teaching missions to diversity, equity, and inclusion (DEI) goals; it includes as a policy objective the fostering of “human diversity” through “research, teaching, and community outreach.” Along with the attention to human diversity in many of its faculty members’ and graduate students’ research projects and in the graduate curriculum, the Museum’s on-campus and outreach programs extend knowledge and awareness of human diversity to both the CU Boulder student body and to the community at large, including statewide. A notable effort, as described by the self-study and as mentioned above, is “the participation of the Anthropology Section and the Museum and Field Studies program in partnership with Mesa Verde National Park to include 26 Pueblos and Tribes in the redesign of a park museum,” which “is both increasing DEI at a national park and teaching the next generation of museum professionals how to do so.” The self-study connects projects such as these to a recent success in recruiting Native students to the Museum and Field Studies graduate program.

ARPAC praises the Museum’s work to align its community, research, and outreach engagements with diversity, equity, and inclusion goals, and its recent achievement in recruiting a more diverse graduate student population. ARPAC encourages the Museum to continue prioritizing these initiatives. Additionally, the committee hopes that future faculty recruiting will allow the Museum to further enhance its diversity, equity, and inclusion goals.

Unit Culture

Along with other institutes, the Museum participated in 2019 in a pilot version of the Campus Culture Survey, that was subsequently administered to the rest of the campus. The Museum’s self-study quotes at length from the report they received to accompany those survey results:

There are some aspects of professional and post-doctoral employees’ experiences at the CUMNH that are positive—problematic identity-related experiences are uncommon, and they feel welcome in and proud to work in their workgroup. However, these employees’ responses indicate several issues that should be addressed to improve the workplace culture at the Museum. Disrespectful norms, humiliating behavior by supervisors, and problematic behaviors that go unaddressed contribute to a lack of community, feelings of being unvalued, and an overall perception that the workplace culture is not positive. In addition, the workplace environment is seen as unsupportive in terms of career advancement and transparency in resource allocation and evaluation criteria.

The self-study also identified various factors that could be contributing to low faculty, staff, and student morale, including physical separation resulting from being housed in different buildings, concerns about the transition to a new director, and the challenges posed by the pandemic. The self-study also acknowledges actions the Museum can undertake to address problematic behaviors as well as the sense of some community members that they are not welcome or don’t belong. The Museum has already undertaken a number of actions, describing its approach as both “grass roots” (e.g., organizing regular “presentation plus happy hour” events for the community) and “top down” (e.g., introducing anti-bias

trainings at all-Museum meetings). An informal survey undertaken by the Museum indicates that these efforts are having a positive effect, and that the faculty, staff, and students especially appreciate the creation of a Justice, Equity, Diversity, and Inclusion (JEDI) committee that is empowered “to organize and take action and continue to fund initiatives that increase, support, and sustain diversity in our unit.”

Faculty and Research Personnel

According to the Office of Data Analytics (ODA) profile for AY 2020–2021, faculty and research personnel in the Museum consisted of: 12 tenured/tenure-track faculty members (including the faculty director); 1 lecturer; 6 museum curatorial/collections professionals (whose work spans research, teaching, and administrative roles); 1 postdoctoral fellow, and 5 professional research assistants. While the budget to pay the museum’s 12 tenure-stream faculty members resides with the Research and Innovation Office, these faculty have tenure homes in Anthropology, Ecology and Evolutionary Biology, and Geological Sciences. In Fall 2022, the museum welcomed an additional faculty member, increasing the total to 13. As previously noted, the director position is held by an interim appointee, and a permanent full-time director position has been advertised at the time of this writing. As previously mentioned, the current director holds an interim position in that role, and the Museum is conducting a search for a full-time permanent director.

The number of TTT faculty has increased significantly in the five years prior to this review. The ODA profile for AY 2015-2016 showed 8 TTT faculty affiliated with the Museum. Neither the self-study nor the external review report stresses the need for additional Museum faculty or research personnel at this time.

In contrast, both the self-study and the external review report describe faculty salaries as a major concern and a major threat for retaining excellent faculty members. The self-study notes that Museum faculty are consistently paid less than TTT faculty in their departmental homes, as much as \$8,000 less than their departmental peers. It cites one example of a Museum faculty member standing for promotion to full professor being paid only \$2,950 more than an incoming assistant professor in their department. Additionally, the self-study noted that the Museum’s collections managers earn less than the graduate research assistants they oversee. The ODA profile offers no data on salaries compared to AAU peers, since faculty salary comparisons for Museum personnel are included with the faculty in their tenure-home units. The external reviewers emphasized that keeping salaries competitive is crucial to retaining both faculty and other research/instructional staff.

Undergraduate Education

The Museum does not offer formal undergraduate education. Instead, Museum faculty members impart education to undergraduates in their cognate departments. From 2014 to 2021 Museum faculty taught a total of approximately 1,200 undergraduate students in 13 named courses in the departments of Anthropology, Ecology and Evolutionary Biology, and Geological Sciences, with enrollments per class ranging from 4 to 170. Teaching assignments are made in coordination between the Museum and the individual department. Nearly 30% of Museum faculty have won awards from the University related to student mentorship.

In addition to course offerings, the Museum contributes to undergraduate education in other ways. Some undergraduate students gain employment on grant-funded Museum projects. While the Museum has little funding for hiring undergraduate students for part-time positions, undergraduates can volunteer to work with the Museum. The self-study also states that during the past seven years, 124

undergraduate students collaborated with the Museum's curation and conservation team and gained knowledge on how to handle and maintain historical artifacts.

The Museum's website includes a dedicated section for "students and faculty" that outlines various ways in which students can explore the Museum and its collections. For instance, there is a designated study area, the BioLounge, that offers refreshments. The Museum also offers students other creative ways to engage with the collection, like the recent Paleopalooza, a chance to say "goodbye" to a fossilized triceratops skull that had been held by the Museum for 40 years and was heading to a new exhibition space at the Smithsonian. Moreover, the Museum permits the use of its space for holding class events in the space (the self-study cites poetry readings among many other examples). Total undergraduate visits to the Museum during this review period were over 100,000.

There are three channels by which the Museum extends tangible assistance to undergraduate education. Firstly, it provides support by permitting students to utilize its facilities for course projects, which is facilitated through an online registration form (<https://www.colorado.edu/cumuseum/content/students-using-museum>). Secondly, the Museum Student Research Award Program offers financial assistance to students with a \$1,200 grant to carry out research in the Museum's facilities or in the field.

Thirdly, the Museum's CHANGE Collective (Cultivating Holistic Achievement, Nourished Growth, and Empowerment) initiative employs around 10 students from diverse backgrounds and comprises

- paid student employment in the Museum (5 hours weekly/\$15 per hour);
- a personal and professional development program (bi-weekly meetings during the term); and
- the opportunity to earn a microcredential administered by the University of Colorado.

The students are assigned to jobs in the public and scientific sections of the Museum. The microcredential is earned through unpaid activities such as reflection prompts, resource collection and sharing, peer evaluation and "inspiration," and participating in an end-of-year public showcase. The Museum estimates the work for the microcredential takes approximately 40 hours to complete. The first CHANGE cohort was in AY 2021–2022 and included six students with majors across the College of Arts and Sciences, the School of Education, and CEAS.

ARPAC is impressed with the Museum's commitment to undergraduate education, both as a unit and via its faculty members' work with undergraduates in their respective cognate departments. This level of effort is especially notable given that the Museum does not have formal teaching responsibilities for undergraduate students.

Graduate Education

The Museum offers two graduate programs: a Master's of Science in Museum and Field Studies (MFS), and a professional certificate designed for museum professionals as well as graduate students from across the Boulder campus. The MFS is a small program, housing approximately 12-15 students in any given year. Since the last ARPAC review, the program conferred 53 MS degrees and 13 professional certificates. Additionally, the program added art and art history as a track of emphasis within the MS degree. The unit does not offer a PhD degree.

The MFS program requires 32 hours of coursework and a 150-hour off-campus internship at a cooperating museum or other institution. The professional certificate program requires 12 hours of coursework and a 75-hour internship outside of CU. The MFS program is the only Museum Studies

program in the University of Colorado System, and the self-study reports it is one of only a handful of programs in the United States focusing on a natural history museum.

Applications to the MFS program doubled over time when comparing 2014 to 2021, but the program has kept acceptances relatively consistent, and thus lowered the acceptance rate. The total students in the MFS cohort as of fall 2020 according to the unit profile was 14, the same number as five years earlier. In AY 2020-21, the program granted four MS degrees, which ranks 39th out of 47 units across campus and last when compared to other units in this review cycle. The median duration to complete the degree is two years, ranking 15th out of 36 units campus-wide and 2nd when compared to other units in this review cycle. The two-year graduation rate is 88%, representing a five-year 54% increase. Although a majority of students (79%) identify as women, which is the highest percentage of any master's program in this review cycle, the number of students who identify as non-white and/or as belonging to an underrepresented race/ethnicity group has decreased in the last five years, resulting in the program's ranking last or next to last percentagewise when compared to other units in this review cycle. (However, the self-study notes a reversal of this trend in the most recent graduate student admissions cycle.) The Museum reports that non-white graduate students accounted for 26% on average over the six-year period from 2015-2021, and non-white students received 30% of the MS degrees awarded.

As previously stated, the Museum acknowledges the underrepresentation of non-white students and has taken measures to broaden its potential applicant pool. This includes distributing fliers or ads with diversity-focused museum organizations, no longer requiring GRE scores due to the test's known biases against female, non-white, and non-traditional applicants, and offering an option to waive application fees to ease socio-economic barriers.

The program also prepares students for work in their field. Graduate students are able to work as research assistants at the Museum during their education, and 83% of graduates found a museum job within 5 months of graduation. Most (two-thirds) were employed at a natural history museum, science center, or planetarium with the remainder largely working in arts, historical, or cultural centers. Others found work in libraries or other fields such as communications, grant writing, graphic design, and/or Ph.D. programs. Half of those who work in museums are collections managers, with the rest in education, exhibit design, or visitor services.

The self-study reports students found their hands-on training to be the most valuable component of their MS degrees. Additionally, two faculty members have won university awards for graduate student mentorship. The unit conducted a survey of graduates in 2019. Ninety-two percent of respondents felt that the MFS program prepared them for a future career in museums, 88% indicated they would recommend it to others, 84% felt that the MFS master's degree gave them a competitive advantage upon graduation, and 85% felt it promoted an inclusive atmosphere. Most students felt the program was rigorous, but a small percentage felt it could be more demanding, specifically in the public administration track.

According to the AY 2020–21 ODA unit data, the Museum employed 11 graduate assistants and five research assistants. Although the MFS program provides financial support for graduate students, it is still a challenge for students to fund their education. In fact, 56% of students who responded to the 2019 survey had to take out student loans to cover tuition and living expenses. Of those respondents, 35% borrowed \$20,000 or more. Additionally, 85% of the surveyed students stated that they would not have enrolled in the MFS program if they did not receive funding from the program. The respondents noted the disconnect between student pay and the cost of living in Boulder as a big part of the problem.

Graduate student stipends totaled \$339,472 in 2021, but it is not clear if all students in the MFS program are fully funded.

The program will undergo strategic planning for the MFS program in the upcoming year, and ARPAC looks forward to learning the shape and results of that strategic planning in the next review cycle.

Postdoctoral Training

As of Fall 2021, the Museum had two postdoctoral research associates, and since the 2014 ARPAC review, the Museum has employed a total of 17 postdocs. However, neither the self-study nor external review report mention any formal postdoc mentoring programs. The self-study referenced the 2019 Campus Workplace Culture study, which identified culture-related challenges experienced by postdocs, particularly in regard to support for their career goals and the transparency of funding opportunities. This may indicate the need for a more structured training process.

Staff

According to the AY 2020–2021 ODA Museum profile, the unit employs 32 staff members. This count does not include faculty members, research/curatorial personnel, or graduate assistants, whose numbers are detailed elsewhere in the report. Of the 32, 26 were university staff and six were classified staff. These employees held various roles, including financial, communications, and administrative assistant support positions, as well as other museum roles like security and guide positions that are essential to the Museum's operation. Additionally, the self-study highlighted the importance of 22 student employees and of numerous volunteers and other non-paid staff members in contributing to the Museum's events and day-to-day functions.

The Museum's staff includes collections managers who contribute to research, teaching, and administration, as previously mentioned in relation to faculty and research personnel. The external reviewer report describes the work of these essential personnel: “in addition to the day-to-day management of the collections, they supervise graduate assistants in their sections, advise graduate students on collections-based research, lead fieldwork campaigns to grow collections, serve on committees for CU as well as for professional societies, manage digital assets, and lead compliance duties ranging from human subjects research and animal care to the Native American Graves Protection and Repatriation Act (NAGPRA) and Endangered Species permits.” In both the self-study and the ERC report, concerns were expressed about the collections managers' low salaries compared to market rates. The self-study highlights the distressing fact that collections managers earn less than the graduate students whom they supervise, train, and mentor, and the external reviewers specifically recommend that these colleagues' salaries be adjusted. Other challenges in the collections manager area of staffing include recent departures and retirements. Finally, the self-study mentions the need to bring one collections manager position from 75% to full time in order to facilitate effective hiring in that position.

The self-study describes staff—meaning both curatorial and administrative staff—as important contributors to the Museum's diversity, equity, and inclusion (DEI) planning and justice, equity, diversity, and inclusion (JEDI) initiative, efforts designed to improve morale among all members of the Museum community, including staff members. At the same time, the self-study mentions staff as suffering a dip in morale because of considerable turnover and the directorial transition.

ARPAC supports the external reviewers' suggestion to increase collections manager salaries and the self-study's proposal to upgrade one position from 75% to full-time. Nonetheless, ARPAC acknowledges that these adjustments might necessitate that the Museum redistribute resources from other departments

and recommends that the Museum collaborate with the dean of the institutes to identify a solution that optimizes the Museum's budget.

Budget

As per the self-study, the majority of the Museum's budget for fiscal year (FY) 2021, amounting to \$4,869,210, came from General Fund sources (\$3,542,034) and from grant-derived Departmentally Administered Indirect Cost Recovery (DA-ICR) monies (\$1,215,991). A minor portion came from auxiliary income (\$29,530) and the revenue generated from gift endowments (\$81,654).

During FY 2021, the Museum's expenditures totaled \$4,869,209. By far the largest category of expenditure was salary, wages, and benefits for its various classifications of employees (\$3,828,435), accompanied by tuition remission for its graduate assistants and research assistants (\$151,531). Operating expenses were \$532,265, and facilities and administrative (F&A) indirect costs were \$311,818. Small amounts of the budget were spent on travel, fixed asset costs, and student support and awards.

The self-study expressed frustration about the stagnant operating budget, which has not been increased over several years, and about recent campus budget cuts. The Museum's limited operating budget has restricted staff from innovating with new approaches and technologies, and from pursuing professional development opportunities.

In ARPAC's view, the Museum's budgetary woes, both in relation to operating funds and in relation to facilities (as described below), are ripe for a solution derived from philanthropic giving. The Museum's relationship to the Office of Advancement is singled out by both the self-study and the external reviewers as in dire need of improvement. The self-study notes that Advancement dropped its involvement in the Museum's annual membership program and left the database for that program in disarray. "Requests for support for fundraising help at the Foundation have gone unanswered," the self-study states. In turn, the external reviewers note that:

We were somewhat confused about what role the University expects the Museum to play in private fundraising and Museum staff seem to be confused about this as well. In general, it appears that Museum staff are discouraged from participating in the cultivation of people or organizations who might be willing to offer financial support. However, the administration noted several times in our interview that private fundraising is a charge of the Museum director.

ARPAC suggests that there is a crucial need for a "reset" of the Museum's relationship with the Office of Advancement, given the Museum's budgetary constraints and facility issues. It is recommended that CU Boulder administration prioritize Museum fundraising efforts and hold the Office of Advancement accountable for fulfilling its responsibility to solicit donors. Furthermore, ARPAC supports the external reviewers' suggestion that the Museum re-evaluate and redefine the membership and role of the Museum's external advisory board to enhance its effectiveness as a vehicle for encouraging donor engagement and support.

Space and Infrastructure

Both the self-study and the external reviewers make it abundantly clear that space and infrastructure not only pose ongoing challenges, but, more importantly, are at the point that they are undermining the Museum's ability to conserve historical artifacts. Additionally, the Museum has digitized a significant portion of its collection, but each Museum section has an individualized approach to the digital archive. There is a need to develop a consistent approach to managing and preserving this asset as well.

Space and infrastructure issues have been amply documented by a study conducted in 2017 by museum planning consultants and architects whose reports include dramatic photographs of water-damaged interior spaces and damaged artifacts. According to all levels of review, these space and infrastructure issues are in nothing short of a desperate need of resolution. Indeed, there is a real risk that because of the infrastructure challenges, key donors may discontinue their support, even beyond the set of donors who have already pulled their planned giving donations due to concerns Museum couldn't adequately care for the gifts because of these space issues.

Poor facility conditions across four different buildings considerably challenge the Museum's curatorial and collections functions. Two of the buildings have issues with temperature control, potentially leading to the degradation of historical artifacts. Furthermore, there has been a problem with artifacts being stolen or damaged while on display. The safety conditions of the facilities are shocking, including violations of the Americans with Disability Act (ADA), damage from floods, and other issues. Upgrades were first recommended in an ARPAC report 36 years ago and have yet to be implemented.

The self-study makes clear the extent of these problems, and the unit's own list of priorities in their new strategic plan includes space and infrastructure improvements. The external reviewers strongly echo the idea that these improvements are critical, both to the physical space as well as the management of the digital assets. In an ideal world the Museum would be housed in a new facility dedicated to the unit, similar to the CU Art Museum. The space could house collections in a climate-controlled and protected environment, offer a single location for the various branches of the Museum operations, comply with ADA regulations, provide educational facilities, and allow for secure exhibition galleries.

The self-study offers several interim solutions to storage and safety issues. As mentioned above, the self-study notes that faculty and staff feel isolated because they are spread over four disparate buildings on campus and hope that temporary adjustments can be made to address that problem, such as acquiring space in the Henderson building. Additionally, there are suggestions for interim solutions to store fragile historical items, such as textiles and artifacts, more effectively. However, the self-study emphasizes that a new building capable of fully and safely accommodating the Museum, its collections, and its faculty and staff is long overdue and must be prioritized.

ARPAC was taken aback that the Museum ranked space and infrastructure needs third on its priority list. ARPAC is unsure as to why this need was listed below the MS curriculum and exhibition conceptualizations. After reviewing both the self-study and external reviewer feedback, it seems evident that this is the most significant issue confronting the Museum.

Additionally, the Museum faces steep rental fees charged it by Real Estate Services for storage on East Campus. ARPAC is troubled by any situation where one campus entity gains profit at the expense of another to fulfill a pressing campus requirement.

Recommendations

The members of the Academic Review and Planning Advisory Committee address the following recommendations to the University of Colorado Museum of Natural History and to the offices of responsible administrators:

To the Unit:

1. Develop a proposal for the dean and provost, suggesting appropriate actions for conservation, preservation, and display of artifacts and for compliance with federal regulations:
 - a Utilize the external reviewers' recommendations for interim harm prevention solutions, like temporarily storing items off-site.
 - b Propose a strategy for fundraising for a longer-term solution, such as a new or renovated building.
2. Upon the hiring of a new director, initiate a strategic planning process to set goals in all areas of the Museum's mission and operations as well as goals for further efforts to improve the Museum's capacity to conserve, preserve, and display artifacts. The strategic plan should set private fundraising as a top priority of the new director.
3. Review the Museum Advisory Board's function and redefine its objectives to better promote successful fundraising and positive community relationships.
4. Building on the successful foundation of the GAMES project and the virtual exhibitions created during the COVID-19 shutdown (including Spanish-language programming), pursue additional new and creative programming and outreach. Continue to emphasize local and regional underrepresented communities and audiences and draw awareness to what makes the Museum a resource for those communities.
5. Build upon work done during the pandemic to update and modernize exhibitions with an eye toward innovation, including increasing online and virtual exhibition and education experiences.
6. Review Museum faculty salaries and propose remediation strategies to ensure that they are fair and equitable when compared to on-campus as well as peer norms within AAU universities and/or within comparable institutions outside university structures.
7. Work with the dean of the institutes to evaluate staffing needs and advocate for hires to bring the Museum to full staffing. As part of this effort, consider ways in which collection managers' salaries can be increased to match the market more closely, including the possible reallocation of funds from other areas of the Museum's budget.
8. Develop formal mentoring procedures for faculty and for postdoctoral researchers.
9. Develop, approve, and implement more transparent criteria for annual performance evaluations for faculty and staff with curatorial duties.
10. Develop formal faculty grievance procedures for the unit.

11. Establish a unified digital asset management strategy, which may involve acquiring appropriate technological infrastructure.
12. As planned, undertake a comprehensive review of the MS in Museum and Field Studies program, including curriculum, student learning outcomes, and assessment.

To the Dean of the Institutes:

13. Support the Museum in developing a proposal for appropriate conservation, preservation, and display of artifacts and for compliance with federal regulations. This proposal should include short-term solutions to prevent immediate damage, such as temporary off-site storage, as well as a plan for working with Advancement on a strategy for fundraising for a longer-term solution, such as a new or renovated building.
14. Assist the museum's new director with the development and implementation of strategic plan, including planning focused on the preservation, conservation, and presentation of artifacts.
15. Assist the Museum's new director in identifying and fostering new revenue streams and private fundraising opportunities. Additionally, provide guidance in defining the director's fundraising roles and responsibilities vis a vis the Office of Advancement.
16. As budget allocations allow, support the Museum's efforts to increase staff numbers and to raise collection managers' salaries to match the market more closely.
17. Support the Museum in reviewing faculty salaries and consider the Museum's proposal for remediation measures to make sure faculty salaries are fair and equitable when compared to on-campus as well as peer norms within AAU universities and/or within comparable institutions outside university structures.

To the Vice Chancellor for Infrastructure and Sustainability:

18. Take immediate action to address the Museum's most urgent and essential physical infrastructure issues, including those that threaten valuable Museum artifacts or pose a threat to the health and safety of the faculty, staff, and students who work within the affected spaces.
19. Upgrade the Museum's facilities to come into compliance with ADA regulations.

To the Executive Vice Provost for Academic Resource Management:

20. Advocate for appropriate timelines and funding to update the Museum's existing facilities, including:
 - a. Measures to address the Museum's most urgent and essential physical infrastructure issues, including those that threaten valuable Museum artifacts or pose a threat to the health and safety of the faculty, staff, and students who work within the affected spaces.
 - b. Measures to update the Museum's facilities to come into compliance with ADA regulations.

21. Collaborate with Real Estate Services to propose strategies aimed at reducing rental charges associated with East Campus Museum storage.

To the Provost:

22. Support a well-considered plan by the Museum for appropriate conservation, preservation, and display of artifacts and for compliance with federal regulations, including:
 - a Short-term solutions to prevent immediate damage, such as temporary off-site storage.
 - b A fundraising strategy to secure a longer-term solution, such as constructing a new or renovated building.
23. Collaborate with the Office of the Chancellor to resolve the strained and ineffective relationship between the Office of Advancement and the Museum and to enable the Museum's new director to prioritize the pursuit of private giving.

Required Follow-up

The director of the University of Colorado Museum of Natural History shall submit two follow-up reports—one due on the first of April 2024 and one due on the first of April 2026. The follow-up reports are to be addressed to the provost and other central campus leadership and shall focus on the implementation of the recommendations from ARPAC detailed herein. The relevant central campus leadership and the provost will also respond to all outstanding matters under their purview arising from this review year's recommendations. Relevant central campus leaders and the provost will submit a follow-up report due on June 1, 2024, and June 1, 2026.