Feedback on the proposed elimination of Stats and EAS

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It is easier to heal the sick than to revive the dead.

The Department of Mathematics will be affected by the proposed budget cuts in several ways, but the most damaging would be the elimination of Statistics and Earth and Atmospheric Sciences (EAS). As science units, Stats and EAS have been impacted by shrinking opportunities for external funding, but their elimination would create far more issues for UNL than solving, as outlined below.

Statistics:

1. **Centrality of discipline.** It is impossible to conceive of an R1 university (especially one aspiring to rejoin AAU) that does not have a Statistics department, or at the very least, be represented meaningfully in another unit. In 2003 when Statistics became a separate unit from the Department of Mathematics, a main argument was the fact that only one other university in AAU had a combined department (of Math and Stats). Moreover, as UNL is situated in a predominantly agricultural state, it risks losing credibility among its stakeholders, at a time when it needs to bolster connections across the state.

2. **Rise of Data Science and Machine Learning.** The societal importance of Data Science and Machine Learning cannot be overstated. These rapidly evolving fields rest on three pillars: Mathematics, Computer Science, and Statistics. UNL invested over two years in designing an interdisciplinary Data Science major, which has already grown to more than 100 students across UNL. We have also started designing a new online Master Degree in Data Science that it is expected to generate close to 500K/year. The elimination of Statistics would jeopardize this momentum. Statistical expertise cannot be replaced by offering a few service courses; it requires a critical mass of faculty engaged in research, curriculum development, and mentoring. Without Statistics, UNL risks undermining both the growth of Data Science and its reputation in preparing students for the data-driven economy.

3. **Path Forward.** If maintaining a stand-alone Department of Statistics is ultimately deemed unsustainable, then a strategic **unit realignment** must be considered rather than outright elimination. To safeguard continuity, a sufficient number of Statistics faculty must be retained, recognizing that some attrition is inevitable in any reorganization. With thoughtful restructuring, budgetary savings on the order of $1M can still be achieved without sacrificing the university's academic integrity.

Earth and Atmospheric Sciences (EAS):

1. **Criticality of the discipline.** The same credibility concerns apply with even greater urgency to Earth and Atmospheric Sciences. The elimination of a department central to studying climate and environmental change—disciplines sometimes publicly challenged precisely because of their rigor and accuracy—would raise serious doubts about UNL's commitment

to addressing some of humanity's most pressing challenges. For a land-grant, R1 institution, removing EAS would be a profound step backward in both mission and reputation.

2. **Partnership with science departments.** EAS has been an indispensable partner across CAS, providing sustained support for interdisciplinary initiatives, including the Data Science major, collaborative research proposals, and joint conferences. Faculty in EAS have consistently worked across unit boundaries, strengthening the university's research profile and serving as reliable collaborators for colleagues in Mathematics and beyond.

3. **Research connections with the Department of Mathematics.** Strong research ties already exist between EAS and the Department of Mathematics. Three current Mathematics faculty (Avalos, Larios, Yamazaki) work on fluid dynamics, specifically the Navier–Stokes Equations, the foundational equations governing fluid flow. Recently, Professors Foss and Radu (together with Larios) have also initiated a collaborative research project in this area with a faculty member in Engineering and a mathematics graduate student. It is expected that the field will continue to grow, given the critical need of reliable prediction tools will as natural phenomena like tornadoes and hurricanes increase in frequency and intensity. Our faculty members have submitted feedback regarding their collaborations with EAS. Eliminating EAS would dismantle critical infrastructure for this work, at precisely the time it is most needed.

Feedback received from math faculty:

Adam Larios: *The Department of Earth and Atmospheric Sciences (EAS) is essential to my research program. In particular, I have sent many students for graduate research positions at Los Alamos National Laboratory (LANL), where they gain world-class expertise, invaluable professional connections, and experience working on cutting-edge science and technology. LANL researchers consistently emphasize that the single most important qualification for students is a background in geophysics. At UNL, this preparation comes directly from EAS courses.*

For many years, all of my PhD students, along with several other PhD students in the math department, have taken the "Dynamic Meteorology" (METR 811/812) course, taught alternately by Profs. Adam Houston and Qi (Steve) Hu. The quality of education in this course, which teaches the fundmentals of fluid dynamics and weather prediction, has been instrumental to their success. Indeed, after taking it, two of my students, Elizabeth Carlson and Collin Victor, were awarded the highly prestigeous Director's Fellowship at LANL. The resulting connections between UNL and LANL have led directly to joint publications, multiple NSF grants, and strong reviews praising the LANL partnership as a particular strength. NSF has repeatedly highlighted the student pipeline to LANL as an excellent example of next-generation workforce training.

If the EAS department were eliminated, the consequences for my program would be severe. It would jeopardize my ability to sustain collaborations with LANL, undermine a research portfolio that has brought roughly $1.7 million in NSF support to UNL, and sharply reduce opportunities for

Nebraska students to participate in world-class science. Moreover, it would interrupt ongoing collaborations with EAS faculty. For example, I am currently working with Profs. Adam Houston and Ross Dixon to establish UNL as a hub for fluid dynamics research in the Midwest through new grant and conference proposals.

In short, eliminating the EAS department would dismantle a highly successful student pipeline to LANL, weaken research connections within and beyond UNL, and remove a major strength in obtaining external funding. I urge the university to reconsider eliminating the Department of Earth and Atmospheric Sciences.

George Avalos: *I have been contacted a couple of my Graduate Students about previous Coursework, taken from members of EAS, and Dylan McKnight provided these details, which might be included in our statement:*

``I (Dylan) took Dynamic Meteorology I & II (811 and 812 I think). Both courses covered in very good detail (for a cross listed grad/undergrad course) the techniques of Navier-Stokes and related laws (ideal gas, etc) at synoptic scales (weather patterns a few states wide and time scales of about a day). I use the intuitions I gained in that course constantly since. Additionally, there was a hefty programming requirement in Matlab that helped bolster my skills. Liz Carlson, Matt Enlow, and Isabel Safarik took the same courses as me, and had similar sentiments. They were also quite full classes, with 20+ students both semesters."

Kazuo Yamazaki: *Prof. Adam Houston is a full Professor in the Department of Earth and Atmospheric Sciences, and he kindly accepted my request to be a Senior Personnel for the NSF proposal to organize EPSCoR Workshop ``Workshop for Research and Workforce Development in Fluid Mechanics in EPSCoR States." The workshop was awarded, and it took place in May 2025; Prof. Adam Houston physically attended some of the talks, when I had the pleasure of meeting him in person (Prof. Ross Dixon was also a registered participant whom I met during the workshop). Through No-Cost-Extension, a follow-up mini conference will take place in April 2026.*

Conclusion:

Both **Statistics** and **Earth and Atmospheric Sciences** are foundational disciplines at any comprehensive, research-intensive university. Their elimination would diminish UNL's academic credibility, weaken its research capacity, and undercut interdisciplinary initiatives that are central to the university's future. Thoughtful realignment, rather than elimination, can achieve financial efficiencies while preserving the intellectual and reputational core that UNL must maintain to thrive as a flagship, land-grant, R1 institution.