Intellectual Merit Criterion

Overall Assessment of Intellectual Merit
Good

Explanation to Applicant
Intellectual Merit: Strengths: - Student has a high GPA and has gained research experience in undergraduate studies. - The student has some collaborative manuscripts in preparation, and has published in one journal and an undergraduate journal, as well as some proceedings. - Student has experience presenting at conferences. - Ellen is interested in public and environmental health, and bringing the tools of data science to bear on problems related to these. She is completing a degree in Applied math, with minors in statistics, economics and geography. The interface of these areas sets her up well to pursue her advanced degrees and proposed research direction. - LOR very strong. Weaknesses: - The proposal itself is very open ended. A simulation study that is realistic would be hard to achieve. The down-sample approach in space and time is not well justified. - The second year proposal to do more advanced modeling is also not well described and the data sources are unclear.

Broader Impacts Criterion

Overall Assessment of Broader Impacts
Excellent

Explanation to Applicant
Broader Impacts: Strengths: - The student has experience talks and presenting posters at conferences and in seminars. - Outreach and service to minority group related to STEM. - The impact of the area of research is strong wrt to public health, global awareness and environmental health, monitoring and evaluation. This is a timely topic given the political climate. - Contributions to the field expected. Weaknesses: - Development of methods to address environmental data is not defined well as a goal. What challenges does this data present that make existing methods not effective.

Summary Comments
Summary Statement: Ellen is a strong student, and will likely be very successful in graduate studies. Her proposal could be improved by additional focus, including a brief literature review. It is unclear the problems that she wants to address and where existing methods and data fall short. Also unclear is the data she intends to use. The motivation is very much there and she is an exception student.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit
Excellent

Explanation to Applicant
The student is a senior applied mathematics major at the University of Colorado (GPA=3.97) and has received numbers honors (e.g., national merit scholarship, Goldwater Scholarship). The students has worked on several research projects resulting in peer-reviewed journal articles (undergraduate, local) and presentations (mainly local). Some publications are in process. Has minors (e.g, statistics, geography) that will make the applicant well prepared for graduate study in biostatistics.

Broader Impacts Criterion

Overall Assessment of Broader Impacts
Excellent

Explanation to Applicant

Has an interest in working as a biostatistician in environmental public health. Has been involved in international development work through CU Engineers Without Borders working with a partner from Nepal (spent a summer in Nepal) and with CU outreach in program focused in increasing underrepresented minorities in STEM. The student is current using data science skills on a community-based research study focused on air pollution and asthma.

Summary Comments

The student has developed a solid research proposal. The application is solid on intellectual merit and the potential for broader impact and is supported by strong letters of reference.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

The applicant has an excellent academic record. Her research accomplishment is brilliant for this stage in her career - an undergraduate. She is a co-author on three publications with two additional papers in preparation. She has presented her work at three conferences. She has participated in different modeling contest including the 2019 COMAP International Mathematical Contest in Modeling in which the paper from her group was selected as one of the six Outstanding out of 5,100+ submissions to the data science problem. References attest to her intellectual ability, she has received both the Astronaut Scholarship (1 of 52 recipients nationwide) and the Goldwater Scholarship (1 of 496 scholars nationwide. The research plan is great- she aims to quantify the impact of differing measurement scale and exposure measurement error in both air pollution and social exposures on asthma epidemiological effect estimates. Would have liked to see a clear distinction between the graduate research plan and other sections of the application.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

The applicant is passionate about her research and wants to apply it to inform scientific standards for data collection and statistical analysis in environmental health, exposomics and geography.

Summary Comments

The applicant aspires to further her understanding of both quantitative techniques and environmental health considerations, so that she can help tailor statistical methods. She is a co-author on three publications and has two papers in preparation. Strong recommendations from her past research mentors and advisor imply future career success of a good candidate.