**Introduction to Critical Zone Science Summative Project: CZO Proposal**

**ATTENTION: New Request for Proposals (RFP) from the U.S. National Science Foundation (NSF)**

**Brief Summary:** The U.S. National Science Foundation has just released $5,000,000 to fund a new Critical Zone Observatory that describes and characterizes how interactions among the atmosphere, lithosphere, hydrosphere, biosphere, and soil support and influence life. The competition requires the submission of a fully-developed research proposal that will be subjected to peer-review.

**Objective:** Write a high quality proposal that describes why NSF should fund your new Critical Zone Observatory (CZO). Your goal is to convince the review panel that your proposed CZO is uniquely posed to answer pressing scientific questions that are not currently addressed by existing CZO’s.

**Details**: 10 pages; double spaced; 11 or 12 font, with 1 inch margins. Proposals will be evaluated using the attached rubric.

**Specific questions to address in your proposal:**

1. What makes your proposed Critical Zone Observatory (CZO) special? Use data from existing CZO’s to show how your CZO is unique compared to other CZO’s and how it will be capable of answering questions no other CZO is capable to answer.
2. What are the fundamental and over-arching scientific principles, Earth system processes, and Critical Zone services will be explored at your CZO?
3. What observations, technologies, and data will be used to explain Critical Zone processes?
4. What specific Critical Zone interactions (e.g. atmosphere, lithosphere, hydrosphere, biosphere and soil) and processes will your new CZO address?
5. What is the potential role for your CZO to offer solutions for a Grand Challenge (e.g. eutrophication, erosion, environmental stability, climate change, water and food production, radiative forcing, water and carbon cycling, etc.) that face humanity and societies?

**Proposal Layout:**

Abstract

Half-page summary

Major research objective

How the new observatory addresses a Grand Challenge

Overarching hypotheses

 Include data and figures in this section

Main Text

Background and Introductory information

Description of Observatory

Describe the soil, lithology, predominate climate regime, dominate vegetation, total area, primary environmental gradients. Include maps to help show location and factors listed above.

Methods

 Types of instruments will your observatory need?

 List specific experiments or exploratory research that will be performed at your CZO

 Explain how you will interface with other CZOs for cross CZO research

Broader impacts, including educational outreach

 Bibliography

 15 Primary peer-reviewed sources (does not count towards your 10 pages)

**Peer and Panel Review:**

All class members will review two proposals and write a one-page summary briefly describing the proposal and the proposal’s strengths and weaknesses. After peer review, we will have an in-class panel discussion where we decide on the winning proposal.

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| Criteria | Exemplary (6) | Good (4) | Acceptable (2) | Unacceptable (0) |
| Purpose | Paper describes and characterizes how interactions among the atmosphere, lithosphere, hydrosphere, biosphere, and soil support and influence life to show that the proposed CZO is uniquely posed to answer pressing scientific questions that are not currently addressed by existing CZOs. | Paper describes and characterizes how interactions among the atmosphere, lithosphere, hydrosphere, biosphere, and soil support and influence life but does not show that the proposed CZO is uniquely posed to answer pressing scientific questions that are not currently addressed by existing CZOs. | Paper lacks characterization of interactions among atmosphere, lithosphere, hydrosphere, biosphere, and soil support and influence life but does show that the proposed CZO is uniquely posed to answer pressing scientific questions that are not currently addressed by existing CZOs.  | Paper lacks characterization of interactions among atmosphere, lithosphere, hydrosphere, biosphere, and soil support and influence life and does not show that the proposed CZO is uniquely posed to answer pressing scientific questions that are not currently addressed by existing CZOs.  |
| Content | All five questions in the RFP are properly addressed. Balanced presentation of relevant and legitimate information that clearly supports the central purpose of showing value of the proposed CZO. | Four or more questions in the RFP are properly addressed. Information provides reasonable support for the central purpose of showing value of the proposed CZO. | Three or more questions in the RFP are properly addressed. Information supports a central purpose of showing value of the proposed CZO. | Two or fewer questions in the RFP are properly addressed. Central purpose of showing value of the proposed CZO not clearly identified. |
| Layout/Organization | The ideas are arranged logically to support the proposal and follow the prescribed layout instructions. | The ideas are arranged logically to support the proposal but do not follow the prescribed layout instructions.  | In general, the writing is arranged logically, although occasionally ideas fail to make sense together and does not follow the prescribed layout instructions.  | The writing is not logically organized and does not follow the prescribed layout instructions. |
| Research Objective/Hypothesis | The research objective and hypothesis is clearly stated and is supported by the use of existing data. | The research objective or hypothesis is clearly stated and is supported by the use of existing data. | The research objective or hypothesis is clearly stated and is not supported by the use of existing data. | No research objective or hypothesis stated in a clear manner and without the use of supporting data. |
| Tone | The tone is consistently professional and appropriate for an academic research proposal. | The tone is generally professional. For the most part, it is appropriate for an academic research proposal. | The tone is not consistently professional or appropriate for an academic research proposal. | The tone is unprofessional. It is not appropriate for an academic research proposal. |
| Grammar,Spelling,WritingMechanics | The writing is free or almost free of errors. | There are occasional errors, but they don't represent a major distraction or obscure meaning. | The writing has many errors, and the reader is distracted by them. | There are so many errors that meaning is obscured. The reader is confused and stops reading. |
| Length, Spacing, Fonts | Paper, spacing, and fonts follow directions specified in the assignment. | Paper, spacing, or fonts nearly follows directions specified in the assignment. | Paper, spacing, or fonts do not follow directions specified in the assignment. | Paper, spacing, and fonts does not follow directions specified in the assignment. |
| Quality ofReferences | Fifteen or more references are primarily peer-reviewed professional journals or other approved sources (e.g., government documents, agency manuals). The reader is confident that the information and ideas can be trusted. | Less than fifteen references are used but the references are primarily peer-reviewed professional journals or other approved sources (e.g., government documents, agency manuals). The reader is confident that the information and ideas can be trusted. | Although most of the references are professionally legitimate, a few are questionable (e.g., trade books, Internet sources, popular magazines). The reader is uncertain of the reliability of some of the sources. | Most of the references are from sources that are not peer-reviewed and have uncertain reliability. The reader doubts the accuracy of much of the material presented. |
| Visuals | Figures, graphs, and/or tables are utilized effectively to convey information and are modified from original state. | Figures, graphs, and/or tables are utilized effectively to convey information but are used “as-is.” | Figures, graphs, and/or tables not utilized effectively to convey information. | No figures, graphs, and/or tables, or figures, graphs, and/or tables do not add information to the report. |

Modified from http://www.k-state.edu/assessment/toolkit/measurement/resrubric.pdf