



How To Conduct Undergraduate Research

Overview

Undergraduate research is, quite simply, a scientific investigation conducted by an undergraduate student. Fisheries research can take many forms. For example, an undergraduate student may assist a conservation agency in sampling sportfish in inland lakes, help a graduate student identify small-bodied native fishes from prairie streams, or design an angler survey instrument with a faculty member. Undergraduate students commonly conduct research for course credit, graduation with honors, professional experience, and/or intellectual enrichment. Research prepares undergraduate students for graduate school and future employment and is a valuable way to contribute to fisheries science early in one's career.

Conducting undergraduate research

1. Brainstorm research ideas
 - a. Identify your research interest area(s).
 - b. Email and/or meet with a faculty member to discuss possible research ideas, especially those related to your interests.
 - c. Consult with graduate students who need research assistants for projects they are completing.
2. Develop research questions, objectives, hypotheses
 - a. Outline the question or questions that need to be answered.
 - b. Conduct a literature review exploring previous studies in areas related to your research.
 - c. Identify knowledge gaps in the literature.
 - d. Outline objectives that will fill knowledge gaps.
 - e. Predict research results based on your literature review and prior knowledge.



3. Make a plan
 - a. Forecast logistical details of the research project (e.g., how much you will work, when you will work).
 - b. Estimate required expenses.
 - c. Obtain necessary supplies and personnel.
 - d. Identify deliverables necessary for project completion.
4. Apply for funding
 - a. Work with your faculty advisor to identify possible grants and funding sources.
 - b. Complete and submit funding applications.
 - c. *See “How to Write Effective Scholarship Applications” document.
5. Collect data
 - a. Perform fieldwork, conduct laboratory experiments, and perform other tasks as required to fulfill your objectives.
 - b. Arrange for research equipment and data to be safely and securely stored.
6. Analyze data
 - a. Consult with a faculty member, graduate student, and/or statistician about appropriate statistical tests to perform.
 - b. Select an appropriate statistical program (e.g., R, SAS, SPSS).
 - c. Save statistical outputs.
 - d. *See “How To Analyze Your Data” document.
7. Organize and interpret results
 - a. Identify important results.
 - b. Elucidate results by conducting a literature review.
8. Write a manuscript or report
 - a. Organize all background information, results, interpretations, and conclusions in the form of a scientific manuscript or report.
 - b. Send drafts to advisors for review.
9. Revise and submit
 - a. Make changes to initial drafts according to edits from advisors.
 - b. Write a final copy and submit it for peer-reviewed and/or university publication.
10. Present and reflect
 - a. If possible, communicate your results in the form of an oral or poster presentation at a scientific conference.
 - b. Reflect on your research experience, highlighting personal growth, areas for improvement, and ideas for future research.



By:

Andrew Carlson, M.S. Candidate, South Dakota State University

Tracy Wendt, M.S. Student, University of Montana

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