

Statement of Research Philosophy

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My vision of research, in an undergraduate department, is one that ties my students directly with my research and allows them to develop the skills and patience necessary to become a contributing member of the scientific community. From the research I have developed and the collections I have made through my graduate studies at Texas Tech University, I have a variety of projects ready for students with varied interests in soft rock geology.

My current research is on conodonts, specifically the genus *Idiognathodus*, of the Middle-Upper Pennsylvanian boundary interval in the Midcontinent Basin. The primary goal of this project is a function-based taxonomic revision that will allow for better application of Midcontinent conodonts to correlation between basins in North America (whether the Appalachian Basin to the east or any of the western interior basins to the west) and globally. The Midcontinent Basin has been a focus of conodont work in the establishment of a microfossil marker for the Moscovian-Kasimovian (Middle-Upper Pennsylvanian) boundary. The work I have completed (expected publication in early 2008) will be of significant importance to the use of conodonts as a marker for this boundary. In June of 2008, the task group for this boundary will be meeting to finalize its decisions. The currently favored conodont from Eurasian strata has been found to be absent from Midcontinent strata in my research.

Projects extending from my current research will include:

- Taxonomic revision of the genera *Adetognathodus*, *Hindeodus*, *Gondolella*, *Idioproniodus*, and *Streptognathodus*.
- Evaluating the response of conodont populations to the chemostratigraphy and lithologic variation of the strata. (Will involve collaboration with students and faculty from Texas Tech University)
- Detailed paleoecology of conodont communities in the Middle to Late Pennsylvanian.
- Evaluation of the effect of variation of ornamentation on the functional surface area of idiognathodid P₁ elements.
- Development of quantitative methods and cladistics for evaluation of evolutionary pathways and ancestor-descendent relationships in conodonts.
- Function and functional morphology of lesser studied conodont genera.

Other areas of research interest include roots in both paleontology and geoscience education:

- Conodonts and stratigraphy of the Silurian-Devonian strata in the Howe's Cave region of central New York State.
- Middle-Upper Pennsylvanian ostracods in North American basins.
- Mississippian and Lower Pennsylvanian conodonts in North American basins.

- The effects of political imprinting on the ability of students to learn controversial topics in the geosciences (Evolution, Deep Time, Global Climate Change).
- The use of project-based studies and students' overall success with acquiring and applying the knowledge required to complete projects.
- The use of surveys as an effective tool for both students and faculty.
- The effect of the virtual classroom on student interest and learning ability by extending lessons beyond class time and the class room.
- The ability of undergraduate students to effectively select their academic speciality in the field of geosciences based on their experiences as undergraduates.
- The effective involvement of students in undergraduate research and the overall success rates of students involved in research as opposed to those who are not.

I hope to develop a consultation operation that will be competitive and highly revered for conodont related projects. The oil industry currently contracts out most conodont biostratigraphic work to those of us in academia. The hope is that most of my smaller research projects will be funded through the profits of consultation. Travel, fluids for dissolution of rocks, and SEM time will likely rank the highest costs in my research. I will work to develop grants both internal to the school and from external sources to fund larger projects and most of the collaborative research I and my students will be involved in.

My initial focus as an undergraduate had been on education. Through research I was able to complete during my undergraduate education, I found equal value and satisfaction from being a good researcher. I look forward to the challenge of research and the opportunities for my development as a professional that it supplies. The coup for me is that I can use my excitement for research to involve my students in research and help them to become successful and contributing members of the scientific community.