

## MOG research Proposal

The proposal format is flexible. We are more interested in content and ideas than format and number of pages. The “NSF style” proposal format was selected to give you a benchmark from which to work. For NSF, we are allowed 15 pages (including figures but not references) to describe the research project. Major sections are:

### **Abstract** (~1/2 page)

Much like a research paper abstract it summarizes the central idea/question the proposal addresses, objective(s), proposed research or approach, and expected impacts.

### **Introduction/background** (5-7 pages)

Give an overview of the current state of knowledge on the particular topics. Include competing ideas and hypotheses as well as the major lines of evidence supporting or not supporting the different hypotheses. Try to be critical in your evaluation of the literature. Because a paper says something is true only means that 2-3 reviewers signed off on the interpretation. You need to make your own assessment based on the strength of the data and the likelihood of alternative explanations. Highlight and place in context the major questions you address in the proposed research. Your goal is to present a strong case for why the research is important, what the next steps should be, and how the expected results will modify or strengthen our concepts of how systems work.

### **Objectives/hypotheses** (1-2 pages)

This is often the most important part of the proposal. Try to clearly and concisely state what hypotheses will be tested, what the larger objectives of the proposal are, and briefly, how the proposed set of measurements will address the hypotheses.

### **Proposed Research** (balance of the proposal).

This is a description of the research plan including sampling (we are more interested in the rationale behind your choice of sampling locations and types of samples than the mechanics of how they will be collected) analytical methods, (again we are more interested in why you chose that particular set of measurements rather than the details of the methodology), blanks and controls, and the numerical treatment/interpretation of the data.

### **Summary**

Provide a brief statement of what you think the impact of your research will be. Be as specific as possible.

### **Figures and tables**

If possible, imbed these into the text. Choose figures and tables that support and lend credence to your arguments. Feel free to redraft, reinterpret, etc. other data but be sure to cite original sources.

### **References**

## Possible research proposal topics

Microbial degradation of DOC; why is DOC so old in the deep ocean?

Dissolved organic nutrients

What fuels microbial diversity in seawater?

C cycling in the Arctic & the consequences of climate change

Controls on carbon preservation in marine sediments

Reconstructing paleo pCO<sub>2</sub> variations from biomarker <sup>13</sup>C records: potential and pitfalls

Evaluation and utility of molecular markers of anaerobic ammonium oxidation (anammox)

Assessing the importance of sediments as sources of DOM to the oceanic water column

Importance of hydrothermal systems to DOC in the ocean

Biogeochemical utility of nitrogen isotopic analysis of chlorophyll and other tetrapyrroles

Are marine algae a viable source of biofuels?

Early diagenesis and light isotope (CHN) fractionation on paleoenvironmental studies using biomarkers

The deep biosphere: molecular evidence and consequences for interpretation of the sedimentary record

Anaerobic methane oxidation and the formation of gas hydrates

Carbon cycling and burial on continental margins and climate: molecular evidence

Allelopathic organic compounds (toxins, grazing inhibitors, etc.)

Organic ligand-trace metal biogeochemistry

Molecular evidence for variations in SST, pCO<sub>2</sub> and photic zone anoxia during Cretaceous oceanic anoxic events (OAEs)

The biogeochemical role and molecular manifestation of viruses in the ocean