

**Geochemistry & Ecology of Red Mat Systems (GERMS)
Summer Research Program**

Red Layer Microbial Observatory (RLMO)
National Science Foundation
Western Oregon University
Yellowstone National Park



INDIVIDUAL ASSIGNMENT QUESTIONS

Each person will type out answers and turn in as Word documents (hard-copy or electronically, via email attachment); Organize your papers according to topics below, clearly labeling each section to match the following.

1. Yellowstone Research Paper Summary

For this assignment, you will review a widely used microbiology journal, Applied and Environmental Microbiology, which is available free on-line (anything older than 1 year).

Part One: The goal will be to find and summarize three different research projects (that do not include my/Boomer's work) that are currently (i.e. within 5 years) going on in Yellowstone.

Go to: <http://aem.asm.org/>

Go to: Search for articles

Search words in title or abstract using: Yellowstone

Select any 3 different studies (excluding ours) and complete the following about each:

Article One	
Title:	
Authors:	
Journal Date, Volume, Pages:	
Site in Yellowstone:	
Key Organism(s) Under Study:	
Goal of Research (BRIEF):	
Article Two	
Title:	
Authors:	
Journal Date, Volume, Pages:	
Site in Yellowstone:	
Key Organism(s) Under Study:	
Goal of Research (BRIEF):	
Article Three	
Title:	
Authors:	
Journal Date, Volume, Pages:	
Site in Yellowstone:	
Key Organism(s) Under Study:	
Goal of Research (BRIEF):	

Part Two: The goal will be to find and summarize this/Boomer's work in this journal.

Boomer's Article	
Title:	
Authors:	

Journal Date, Volume, Pages:	
Site in Yellowstone:	
Key Organism(s) Under Study:	
Goal of Research (BRIEF):	

In one page, explain how you believe your data and participation this summer are related and/or contribute to things you gleaned from this article.

2. NCBI Yellowstone Summary

For this assignment, you will review a widely used national database (NCBI – National Center for Biotechnology Information), which catalogs both research publications and molecular data (both protein and DNA). The goal will be to search this site to get a feel for the level and kinds of research going on in Yellowstone. This site is considered more broad because it represents both published and unpublished information.

I. Part One

Go to: <http://www.ncbi.nlm.nih.gov/>

In the Search (all databases) box: type Yellowstone

Record the numbers of hits for the following specific fields:

PubMed Central (note – these are all free articles on-line):

Nucleotide/GenBank (note – these are all DNA sequenced):

Protein (note – these are all inferred protein sequences):

Genome (note – these are complete genome projects):

Structure (note – these are protein structures for which crystallography has been done):

II. Part Two

For this part of the assignment, you will work off the main hit screen above, this time digging deeper into several categories for more information about specific molecules (e.g. DNA, protein, genome). For each, you will be clicking deeper into each page until you come to a detailed information report that lists all kinds of additional information about the sequence.

Nucleotide: Click the nucleotide hits and, from the new screen, select any single entry that interests you. Click on the target nucleotide hit to see a more detailed information report. From this report, determine the following:

- (a) Which gene is being studied?
- (b) Which organism is being studied?
- (c) Which area/site in Yellowstone did this come from?
- (d) What is the title of this project or publication?

Protein: Click the protein hits and, from the new screen, select any single entry that interests you. Click on the target protein hit to see a more detailed information report. From this report, determine the following:

- (a) Which protein is being studied?
- (b) Which organism is being studied?
- (c) Which area/site in Yellowstone did this come from?
- (d) What is the title of this project or publication?

Genome: Click the genome hits and, from the new screen, select any single entry that interests you. Click on the target genome hit to see a more detailed information report. From this report, determine the following:

- (a) Which organism is being studied?
- (b) What is the total size (in base pairs) of the genome?
- (c) What is the % GC of this genome?
- (d) How many total genes are predicted in this genome
- (e) Click the GenBank link and try to determine the following:
 - a. Which area/site in Yellowstone did this come from?
 - b. What is the title of this project or publication?