

Attachment A: Linear Model Worksheet

Simple Linear Model of Ungulate Response in a Non-thermally Influenced Area of Yellowstone National Park

Basics—(soil, water, ground temperature)



PLANT GROWTH



ELK RESPONSE



**ELK SURVIVAL
16-25 YEARS**

**What
happens
when**



OR



are added?

1. How does a hydrothermal feature change the basic ecological factors of water, soil, and ground temperature in an area?

2. How do these hydrothermally-caused changes affect the plant growth in an area?

3. How do elk respond to the hydrothermally-caused changes in plant growth?

4. Would you expect an elk to live longer in an area that is influenced by hydrothermal features? Why or why not?

FACT

On average, an elk living in an area *with* hydrothermal activity lives between five to ten years **LESS** than an elk living in an area *without* hydrothermal activity.

QUESTION

Why do elk die at a younger age in hydrothermal areas, even though the grass in such areas is more plentiful for longer periods of time?

HINT

The water and soil of hydrothermal areas contain large amounts of fluoride and silica. These geochemical differences are also reflected in much of the area's vegetation. Too much fluoride causes severe tooth decay. Silica is one of the major ingredients of quartz and glass. It is much harder than calcium, which is the chief ingredient of bones and teeth.

Your Task

Apply this new information as you complete the linear model on the following page.

Simple Linear Model of Ungulate Response in a Hydrothermally Influenced Area of Yellowstone National Park

Which of these basic ingredients are affected by hydrothermal activity and how are they affected?

Basic Ingredients

Soil _____

Water _____

Ground Temperature _____



How do hydrothermally-caused changes in the basic ingredients affect plant growth?

Plant Growth _____

_____.



How do hydrothermally-caused changes in plant growth affect the elk's response and distribution?

Elk Response _____

_____.



How do changed levels of fluoride and silica in the plants affect the elk's teeth?

Dental Health of Elk _____

_____.



How does the condition of the elk's teeth affect its overall health and survival?

Elk Health and Survival _____

_____.