Monitoring Ecosystems

Real World Ecosystems
Learner Worksheet
Grade Level: 5-8

Name:

After reading the Natural Disturbance Backgrounder, answer the following questions.

Part A Questions:

1. **What is the main purpose of environmental monitoring?**

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2. **What is an environmental indicator?**

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3. **Provide three examples of environmental indicators:**

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4. **Describe an environmental indicator that could help you monitor the health of trees in a local park:**

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5. **What is the purpose of a test well?**

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6. **Describe 3 environmental indicators that could tell a biologist about the health of a river:**

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7. **Provide an example of an international environmental monitoring program. Describe what elements of the global environment it monitors, and what is does with the information.**

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8. **Compare the boreal forest and tropical rainforest. Describe a major difference in the natural disturbances that each experience.**

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Part B
Monitoring Ecosystems: Keeping Score

Use the information below to answer the following questions:

The table below represents several years' worth of measurements for an unnamed central Alberta lake. Each number represents the **average** number of algal cells counted over the course of a whole month, per milliliter (mL) of water from the lake. The samples came from the surface of the lake. The survey started ni 1998 and continued through to 2003.

The algae that were counted in this survey are similar to bacteria, but have a type of chlorophyll that allows them to use sunlight to make sugars. They are known to increase in numbers when the concentration of a chemical called phosphate increases in the water. Phosphates are known to enter the lake with runoff from cattle pastures and untreated human sewage. At concentration over 2500 cells per mL, these algae can make the lake uninhabitable for some kinds of fish.

Your task is to graph the information, then use the graph to explain what might be happening in this lake. You may use a spreadsheet or graphing program to d his, or you can plot the points be hand on graph paper. After you have graphed the data, you will be able to answer the questions that follow.

Date	Cells/mL	Date	Cells/mL	Date	Cells/mL
January 1998	45	January 2000	55	January 2002	80
February 1998	60	February 2000	66	February 2002	89
March 1998	58	March 2000	87	March 2002	145
April 1998	70	April 2000	224	April 2002	299
May 1998	190	May 2000	409	May 2002	833
June 1998	350	June 2000	497	June 2002	1167
July 1998	1255	July 2000	1190	July 2002	2186
August 1998	1663	August 2000	1448	August 2002	3447
September 1998	150	September 2000	228	September 2002	1339
October 1998	110	October 2000	187	October 2002	398

Date	Cells/mL	Date	Cells/mL	Date	Cells/mL
November 1998	85	November 2000	104	November 2002	115
December 1998	54	December 2000	61	December 2002	90
January 1998	50	January 2001	48	January 2003	70
February 1999	61	February 2001	59	February 2003	67
March 1999	59	March 2001	103	March 2003	324
April 1999	90	April 2001	280	April 2003	397
May 1999	483	May 2001	741	May 2003	1058
June 1999	659	June 2001	1052	June 2003	1787
July 1999	1625	July 2001	1548	July 2003	1937
August 1999	1874	August 2001	1965	August 2003	3812
September 1999	418	September 2001	951	September 2003	2048
October 1999	185	October 2001	265	October 2003	577
November 1999	58	November 2001	117	November 2003	257
December 1999	61	December 2001	85	December 2003	167

Part B Questions:

1. **In what season do the algae reach their greatest numbers?**

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2. **In what season do the algae reach their lowest numbers?**

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3. **How would you explain the seasonal differences in algae?**

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4. **Based on your graph, what trends do you notice regarding the algal population in the lake from year to year?**

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5. **What do you think might cause the trend you see in the population of algae from year to year?**

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6. **Based on the numbers and trends for algae in the lake water, what human activities could be happening near this lake?**

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