

Is it Drought?

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Abstract

In Montana, the ponds and streams are important to society and nature. Its health is important. Recently, hotter summer than usual and a dry winter led researchers to the question: “Does climate change induced drought affect water quality: turbidity, pH, macroinvertebrate health, dissolved oxygen, salinity, etc.” the scientists hypothesis is: “Yes, climate change induced drought will affect some aspects of water quality such as: macroinvertebrate health, dissolved oxygen, phosphate, nitrates, coliform bacteria, and electrical conductivity.

First, the researchers went to a local stream where the researchers mapped the location and determined the latitude and longitude with a GPS. After that the scientists tested: turbidity, phosphate, nitrate, pH, dissolved oxygen, alkalinity, coliform bacteria, macroinvertebrates, electrical conductivity, and temperature.

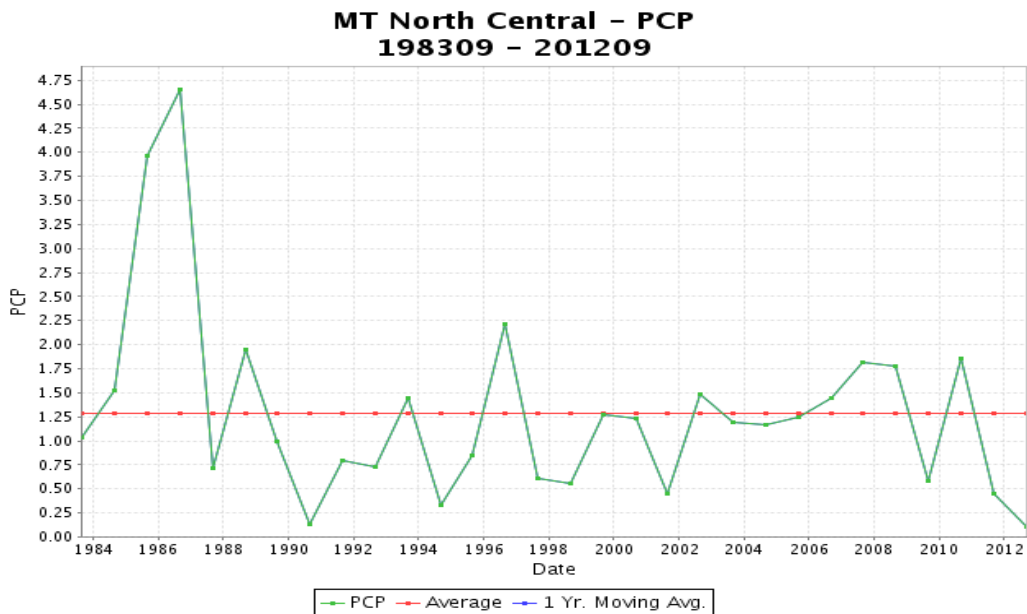
At this time, the results are inconclusive until Golden Ridge researchers have the opportunity to conduct more tests over a longer period of time.

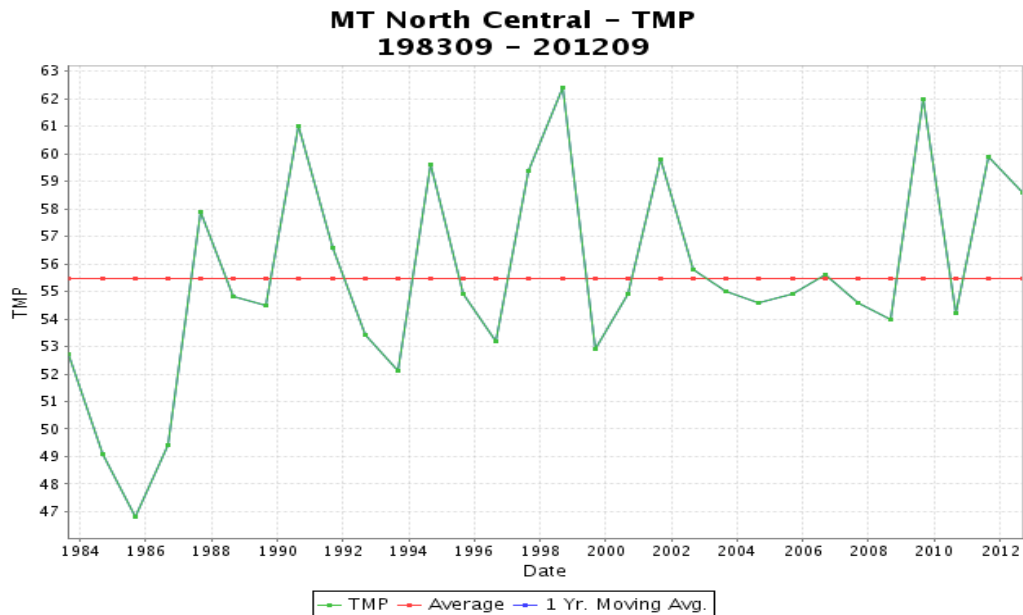
The researchers’ conclusion is inconclusive and more data is needed. The scientists would like to do further tests on the temperature, turbidity, pH, macroinvertebrate health, dissolved oxygen, salinity, etc.

Introduction

Golden Ridge researchers have questioned whether drought affects the health of the water, noticing that the past summer was rather hot. Plants are flowering faster according to recent BBC reports. Longer growing seasons may affect insects and animal migrations, and may mean the need for more water (Globe, September 2012). The researchers have noticed that there are signs of this happening in their area, such as the discovery of macroinvertebrates that were visible from the surface when there were not any expected at that time of year. This led the scientists to the question: “Does climate change induced drought affect water quality: turbidity, pH, macroinvertebrate health, dissolved oxygen, salinity etc.”

The first graph below represents the precipitation for the years 1984-2012 in our local area. The second graph represents the temperature from the years 1984-2012 in our local area. That space of time from 1984-2012 was decided because it is a span of thirty years and that is climate. Anything under that space of time is weather. The reoccurring pattern of the graphs from the years 1984-2002 shows that when the temperature goes down the precipitation goes up. From the years 2002-2007 they are about level without too much differences and then from 2007-2012 precipitation goes down drastically and the temperature goes up drastically.





Data from: <http://www7.ncdc.noaa.gov>

Hypothesis

The researchers' hypothesis is that, yes, climate change induced drought will affect some aspects of water quality such as macroinvertebrate health, dissolved oxygen, nitrates, phosphates, coliform bacteria and electrical conductivity.

Procedure

First, the researchers prepared for water testing with: goggles face masks, rubber gloves, a GPS for determining latitude and longitude, and the various test kits for the project: turbidity, phosphate, nitrate, pH, dissolved oxygen, alkalinity, coliform bacteria, macroinvertebrates, electrical conductivity, and temperature. Following that, the scientists decided on a location with an accessible body of water, in this case, a stream. The scientists went to the decided location to perform the tests, recording the results as they progressed. In this case, they performed three separate tests on three different occasions on all the globe protocols.

Results

- Test One: September 17, 2012
- Test Two: October 4, 2012
- Test Three: April 2, 2013

Protocols	Test One	Test Two	Test Three
Turbidity	20JT _u	60 JT _u	0 JT _u
Phosphate	1.5 ppm	1 ppm	2ppm
Nitrate	0-5	0-5	0-5
p.H.	7.5	8	8
Dissolved oxygen	8ppm	4ppm	4ppm
Alkalinity	49	200	0
Coliform bacteria	inconclusive	inconclusive	positive
Macroinvertebrates	*see following table	*see following table	*see following table
Electrical conductivity	Average of 545.75	Average of 496	Average of 595
Temperature	Average 8°C	Average of 5°C	Average of 11°C

	Test One	Test Two	Test Three
*Macroinvertebrates	One crane fly larva, one tubifex worm, two may fly larvae, one nematode, two pouch snails and one stone case cadis fly larva.	One nematode, ten pouch snails, one unidentified snail, one water mite, four mayfly larvae, and one midge fly larva.	One pouch snail, one water mite, two finger nail clams, ten thread worms, one tubifex worm, two watersnipe fly larvae, one planaria, and one midge larva.

Conclusion

The researchers' conclusion is inconclusive for the time being due to the lack of data. The scientists require more time to conduct more tests to come to a conclusion.

Bibliography:

<http://www7.ncdc.noaa.gov/CDO/cdodivisionalselect.cmd?nationSelect=110®ionSelect=108&stateSelect=24&divisionSelect=03&startMonthSelect=09&startYearSelect=1983&endMonthSelect=09&endYearSelect=2012&outputRadio=staticGraph&staticGraphElementSelect=PCP&filterSelect=09&method=doStaticGraphOutput&reqtype=division>

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