Climate Change Impacts on the Water Supply of the Colorado River

This curriculum module will look at climate change impacts that affect us locally right now. We will study the data, the possible consequences to various user groups, and suggest solutions to adapt to these changes, which are all objectives of this course.

Your first part of the assignment is to become acquainted with the Colorado River watershed as shown in this image. The source of the water is in the snowpack of regional mountain ranges (mostly the Rockies). It then flows southwest through the red desert of Glen Canyon National Park on through the Grand Canyon in Arizona, forming Lake Mead on the middle left side of the image, down through the agricultural lands on the California, Arizona and Mexico border. Look at where the water is coming from and the vast deserts it must travel through before reaching its destination in the Gulf of California. Who is using the water and for what purpose?

As introduction to this module, you must first answer that question before continuing. Do some research and cite your sources. Give a brief explanation where the water is coming from and where it is going (most will be diverted without actually reaching the ocean). How will climate change impact your answer? We have also provided a graph and data set below that shows the percent of average snowpack found in Colorado that feeds into the Colorado River. Look at the data and answer the following questions.

1. Considering the title and the graph, what are the units on the graph?
2. When was the maximum amount of snowpack? When was the minimum amount of snow pack?
3. Do these max/mins validate or disprove that climate change is occurring? Are max/mins an example of a region's climate or weather? Explain.
4. Pick a month (not January or June since they do not have complete data sets) and find the average from 1968 to 1988 and then find the average for 1989 to 2009. When did we get more snow and when did we get less snow?
5. Is this data set long enough to establish whether climate change is occurring? Explain your answer.
6. If there is less snowpack in the Colorado Rockies, what do you think that will mean for the amount of water available to the watershed? What will happen to the level of Lake Mead?

Table 1.   Monthly percentages of average snowpack in Colorado for the Colorado River watershed for years 1968-2009.

	Jan	Feb	March	April	May	June
1968		93	102	92	115	
1969		131	106	102	76	
1970		148	131	130	165	
1971		135	129	125	125	
1972		121	110	98	95	
1973		113	88	92	134	
1974		125	112	110	106	
1975		106	106	117	125	
1976		92	97	95	87	
1977		38	40	54	38	
1978		145	131	133	126	
1979		132	117	127	132	
1980		126	139	139	144	
1981		40	42	57	29	
1982		145	122	121	128	
1983		89	90	123	142	
1984		160	139	141	169	
1985	131	108	101	101	104	
1986		110	127	108	124	142
1987	80	73	70	73	43	20
1988	77	96	97	93	87	69
1989	91	85	96	83	59	39
1990	69	71	71	77	73	61
1991	76	75	71	89	108	62
1992	97	81	78	88	65	15
1993	105	102	126	124	151	145
1994	92	84	91	88	85	29
1995	84	81	98	103	132	321
1996	100	131	139	131	140	98
1997	160	161	140	118	142	146
1998	81	92	94	89	99	50
1999	65	89	89	75	91	99
2000	51	79	94	97	84	10
2001	95	82	85	86	79	18
2002	72	70	68	63	27	0
2003	93	82	93	101	105	47
2004	91	85	83	64	55	23
2005	96	102	98	98	88	73
2006	133	128	115	110	78	38
2007	102	91	95	81	71	34
2008	105	122	128	123	120	146
2009	127	123	115	104	99	31

Percentage of Average Snowpack