

## Box Creek SNOTEL

Box Creek SNOTEL, located on Monroe Mountain near Richfield Utah (N 38 30.48, W 112 01.12, Elevation 9828 ft) has recently been impacted by a logging project. This could have an impact on the accumulation and ablation characteristics of the Box Creek SNOTEL site. We are unsure as to whether the average snow accumulation will remain stable, increase or decrease. With the removal of the canopy and consequently a large increase in short wave solar radiation to the pillow, this site may experience faster snowmelt than it has historically. The logging project was completed in the summer and fall of 2009.



Box Creek looking south pre logging



Box Creek looking south, post logging



Box Creek looking west, pre logging



Box Creek looking west, post logging



Box Creek looking east, pre logging



Box Creek looking east, post logging



Box Creek looking north, pre logging



Box Creek looking north, post logging.



Box Creek, looking north across the site pre and post logging.



Looking west across the site pre and post logging.



Looking south across the site, pre and post logging.



Looking east across the site, pre and post logging.

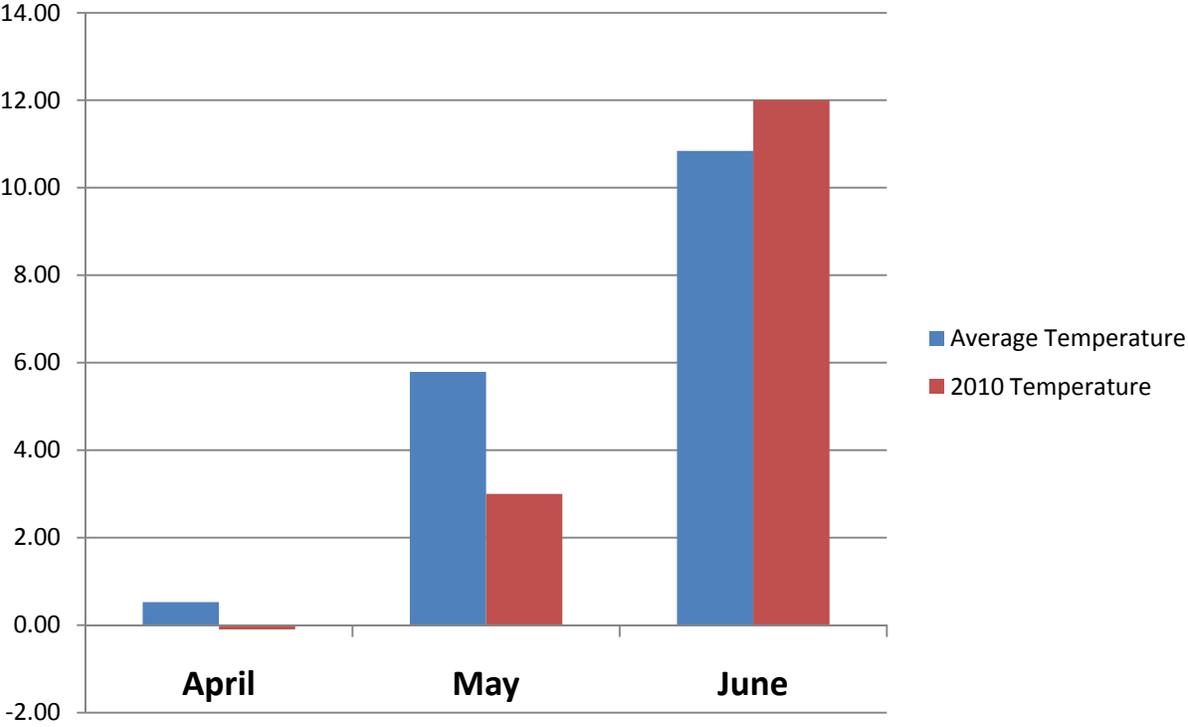


A general overview of the current condition of the Box Creek SNOTEL site – basically a small island of trees in a significant clear cut.

With the removal of the surrounding canopy (existing canopy is only about 20 feet wide around the site) snow characteristics may change and it will take some time for us to determine what the new characteristics are. This site has a much greater exposure to solar radiation than the previous conditions and we might reasonably expect faster melt rates all other conditions being equal. Thus hydrologic models and equations utilizing data from this site are likely compromised and future data may not yield results consistent with the historical data.

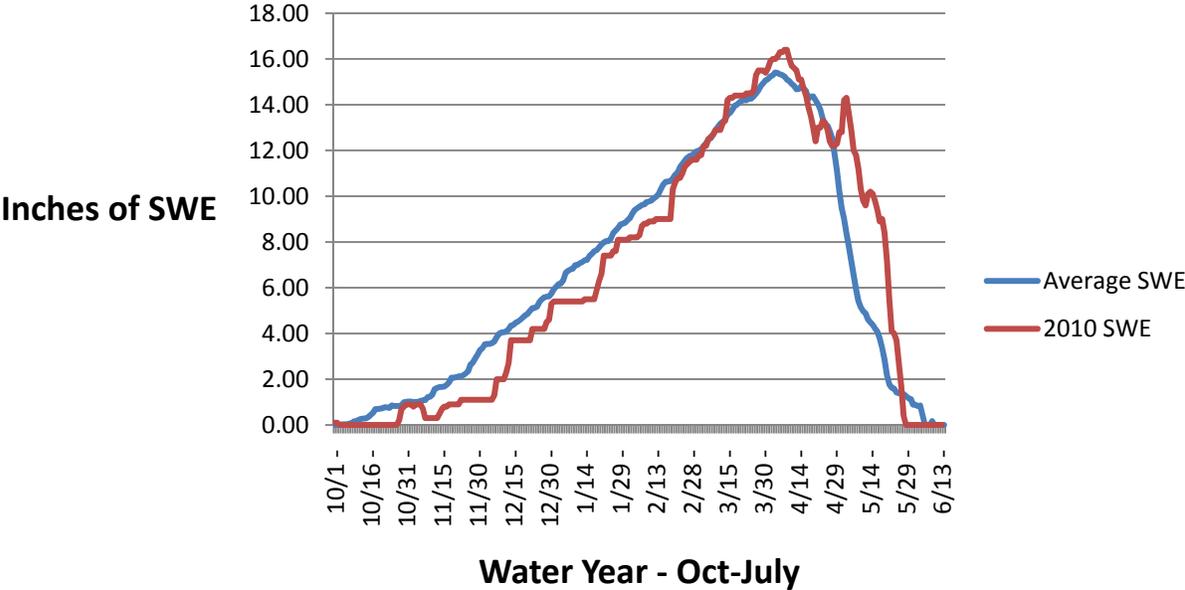
With only one snow accumulation/ablation season in hand we have far too little data to generate a statistically valid evaluation. This coupled with a spring melt season that was very cool until June makes it difficult to ascertain the magnitude of the impacts to the site. April was about 0.5 degrees C below the average, May was about 3 degrees C cooler and June was a little more than a degree warmer. The ablation rate in the latter portion of the 2010 season was very fast compared to years with similar SWE accumulation (about 16 inches).

# Box Creek Average Monthly vs 2010 Temperatures



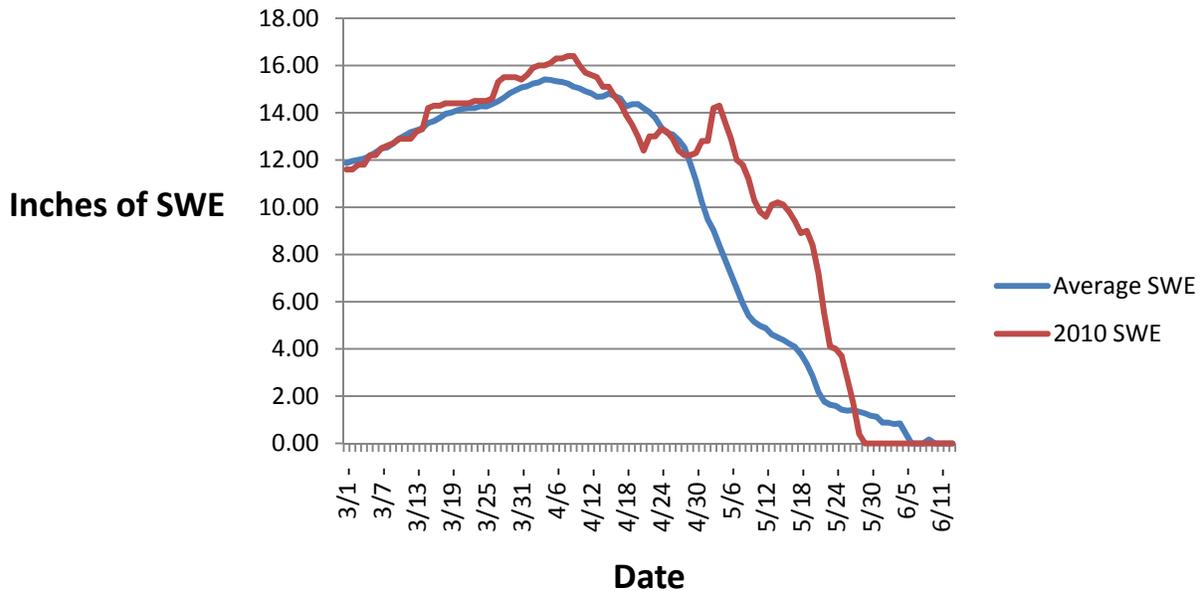
Box Creek period of record Average Monthly Temperature vs 2010 Average Monthly Temperature. Degrees C.

# Box Creek SNOTEL Pre and Post Logging SWE for Years with ~ 16 inches of SWE



Box Creek pre (average daily SWE) and post Logging (2010 daily SWE).

## Box Creek Average Meltout vs 2010 Meltout (pre and post logging) for years with April 1 SWE ~ 16 inches



Same graph as above – with only the ablation portion. The Average SWE line represents only the average of those historical years where the peak SWE was between 14 and 18 inches to try to compare the current year to comparable historic years. In this year, daily melt rates are very comparable to the average daily melt rates of similar years even with a slightly cool April and a very cool May – about 0.55 inches per day over the entire ablation period. One can note that in the latter portion of the 2010 ablation season, melt rates are very high compared to the ‘average ablation curve’, on the order of 1.0 to 1.5 inches per day. However, given that this occurred in the latter part of May, melt rates of that magnitude are not uncommon.

### Summary

Given the extent of canopy change at the Box Creek SNOTEL site and surrounding area, we anticipate changes in the accumulation and ablation characteristics at this site. Those using the data from this site need to be aware that current and future data from this site may be different than the historical context. Snow Survey personnel will closely monitor the site and compare it with others in the area to

determine the magnitude and direction of any changes. We will need at least 5 or more years to render a statistically valid comparison.

R. Julander, June 2010.