Snow Coverage Area for the Sierra Nevada –April 1, 2011

The following analysis of **S**now **C**overed **A**rea (SCA) is derived from MODIS (Moderate Resolution Imaging Spectroradiometer) aboard NASA's Terra and Aqua satellites. Data from MODIS are processed to provide a resolution of 500 meters and a fractional SCA product where each pixel can range in value between 0 and 1 (e.g. 0.50=50% of the 500 meter pixel is covered by snow) as opposed to the operational binary product that defines a pixel as either snow or snow free. The MODIS SCA product is available on a daily basis, but viewable areas are subject to cloud cover. In addition, tree canopies mask a portion of the SCA and should be viewed accordingly based on the vegetation characteristics of each hydrologic unit and watershed.

This analysis covers the Sierra Nevada and various river basins, with Figure 1 highlighting the SCA over the Sierra Nevada for March 31, 2011 and March 31, 2010, and Figure 2 showing the monthly change in SCA between March 1 and March 31, 2011. Figures 3 (a-e) focuses on the **Feather**, **American, Tuolumne, Merced, and Kaweah** River basins. The historical April 1 SCA represent the average observable SCA across each 300 m (1000 foot) elevation band over the MODIS period 2001-2010. Additional basins will be added throughout the year and upon request.

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For further information or comments/suggestions please contact Robert Rice (rrice@ucmerced.edu) or (209)228-4397.

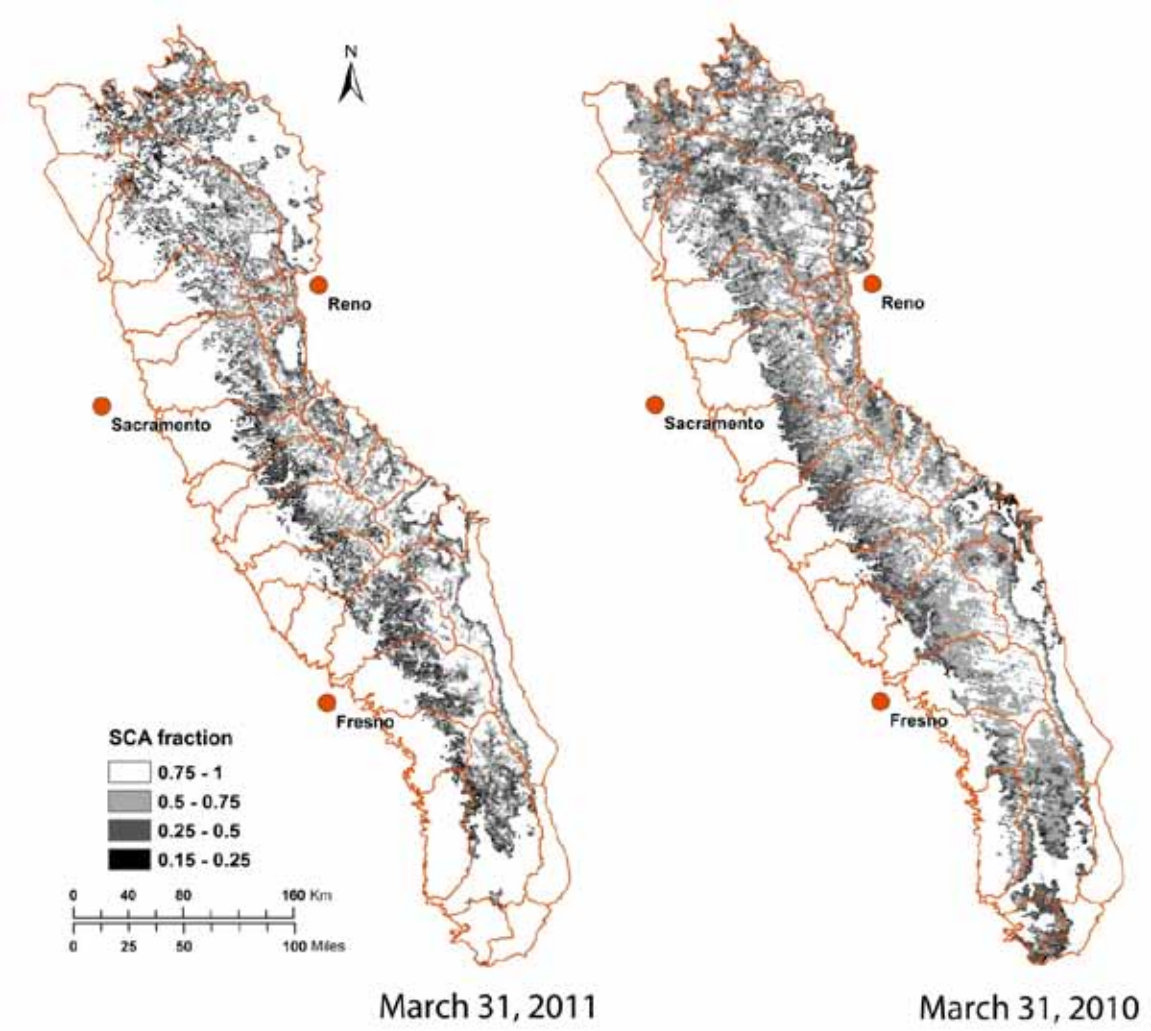


Figure 1. SCA over the **Sierra Nevada** on March 31, 2011 and 2010 outlined by the individual watersheds. Evident is the similar snow cover extent between March 31, 2011 and 2010, in which the statewide snow water equivalent (SWE) on April 1, 2011 was 171% of the historical April 1 average, and April 1, 2010 was 104% of the historical April 1 average.

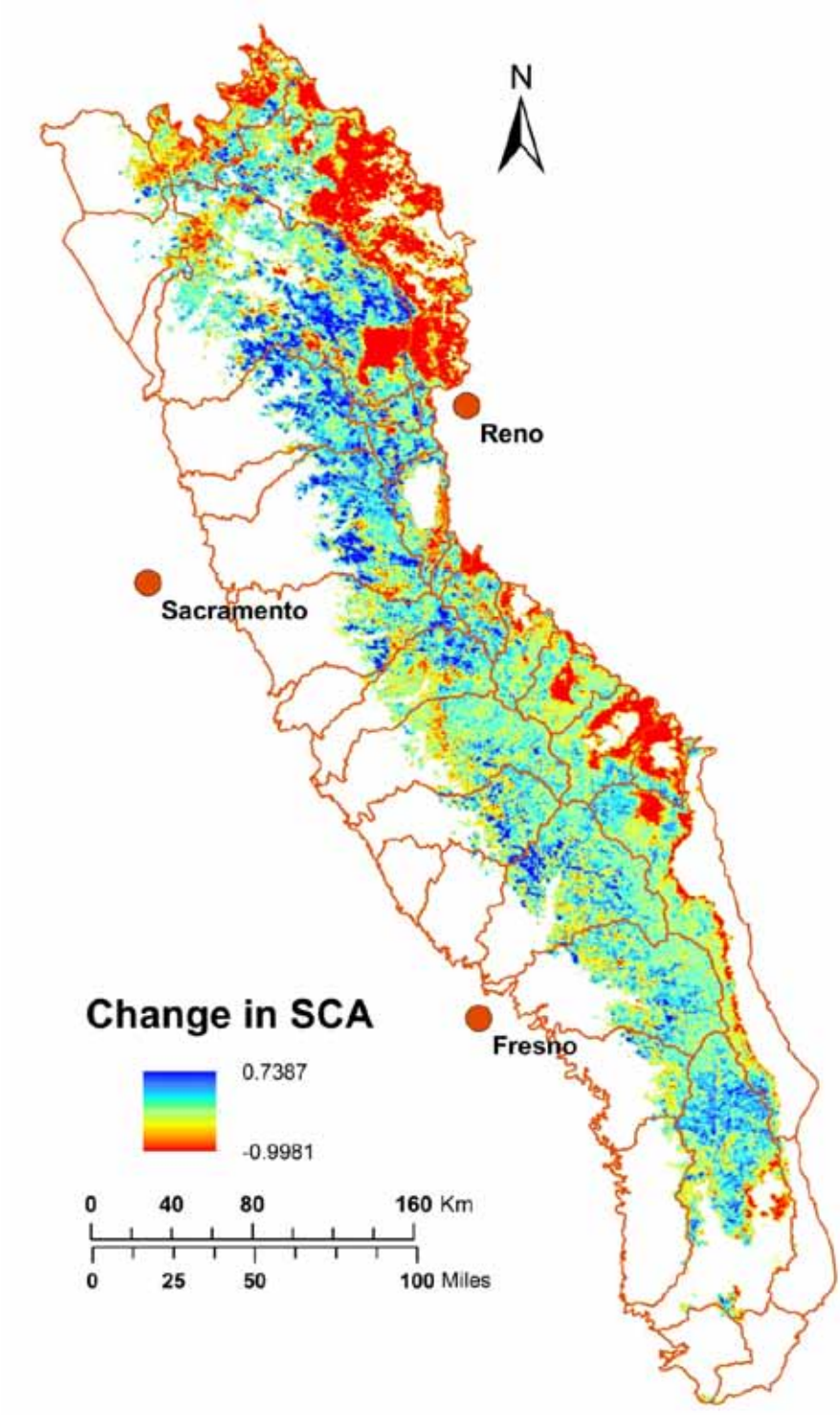
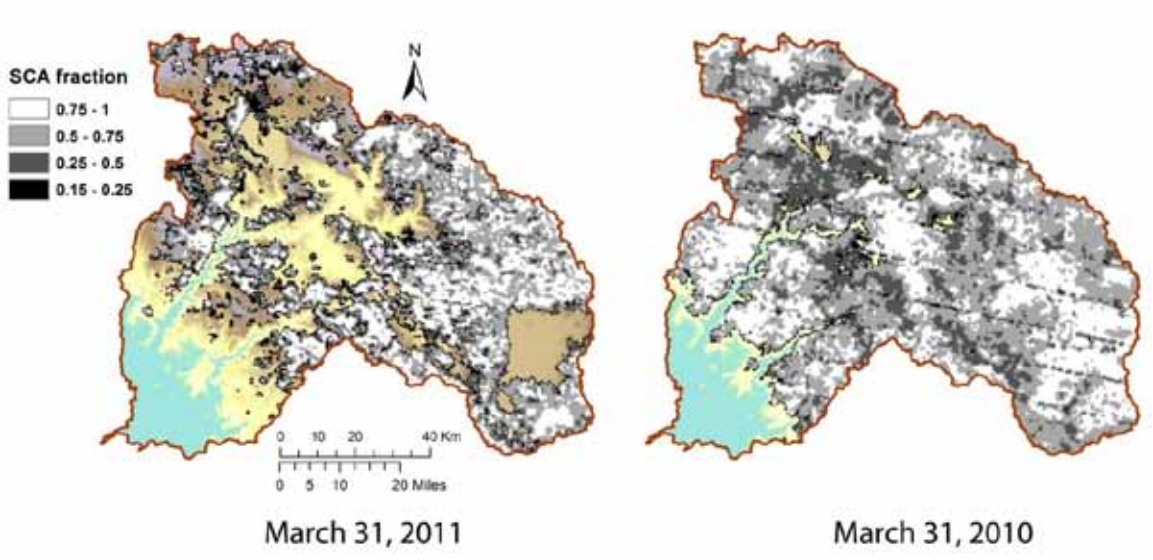
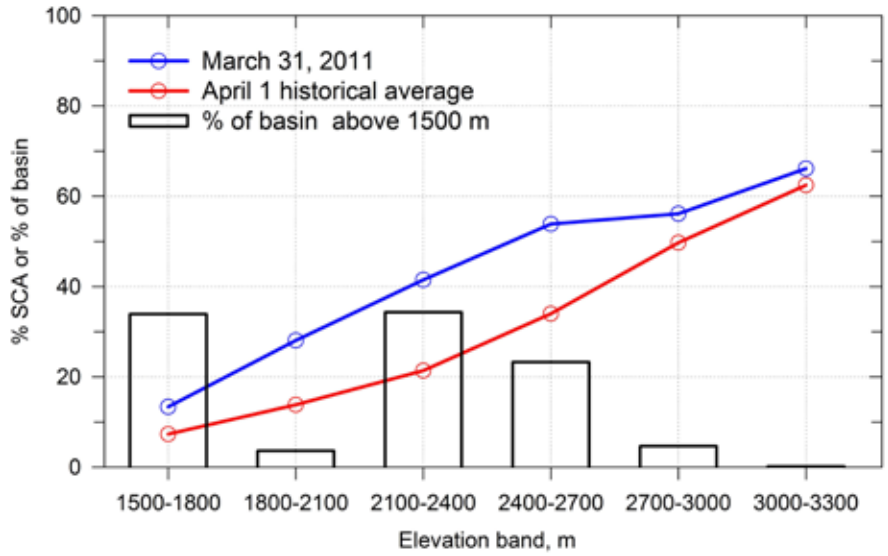


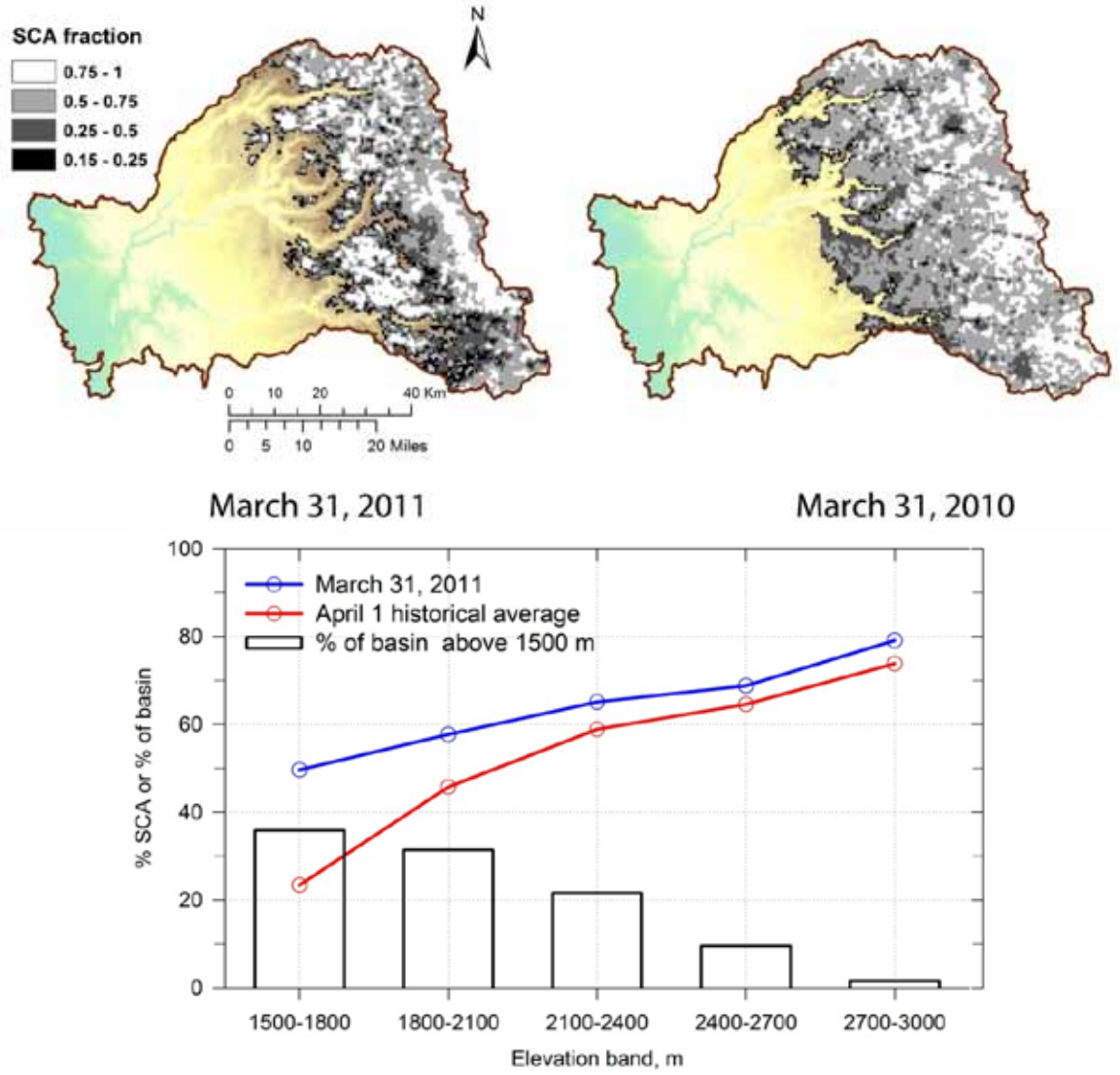
Figure 2. The graph shows the % change of SCA from March 1–March 31, 2011. Of interest was a net increase in snow cover area in the Sierra Nevada, as wet conditions and cool temperatures contributed to the increase.





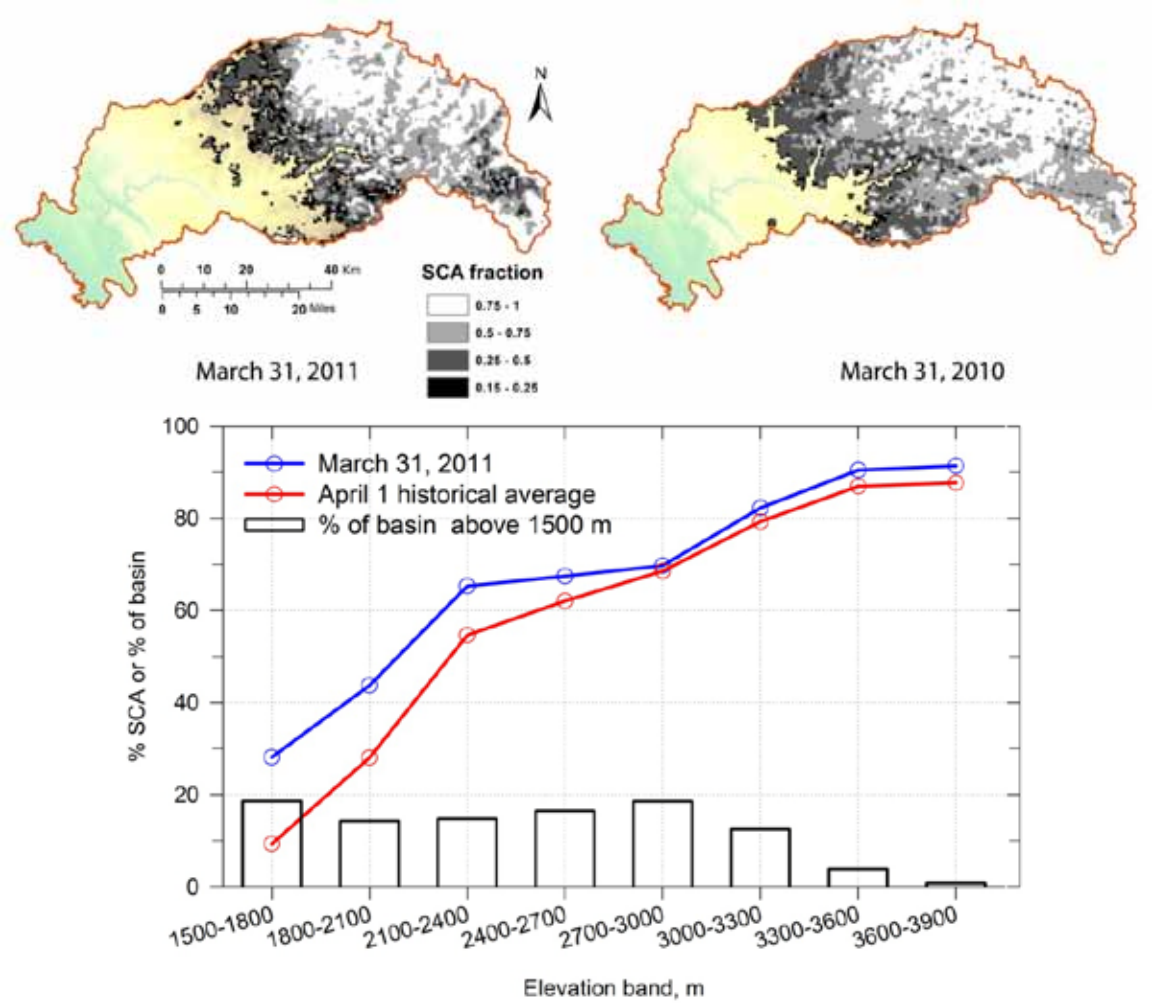
	March 31, 2011	April 1
1500-1800	13%	7%
1800-2100	28%	14%
2100-2400	42%	21%
2400-2700	54%	34%
2700-3000	56%	50%
3000-3300	66%	62%

Figure 3(a). SCA over the **Feather River** basin on March 31, 2011 and 2010. On April 1, 2011 basin-wide SWE was 179% of the April 1 historical average (based on basin-wide snow course data). April 1, 2010 was 105% of the April 1 historical average. Graphical and tabular data represent average % SCA by 300 m (1000 foot) elevation bands over the **Feather River** basin for March 31, 2011 and the April 1 historical averages based over the MODIS period 2001-2010.



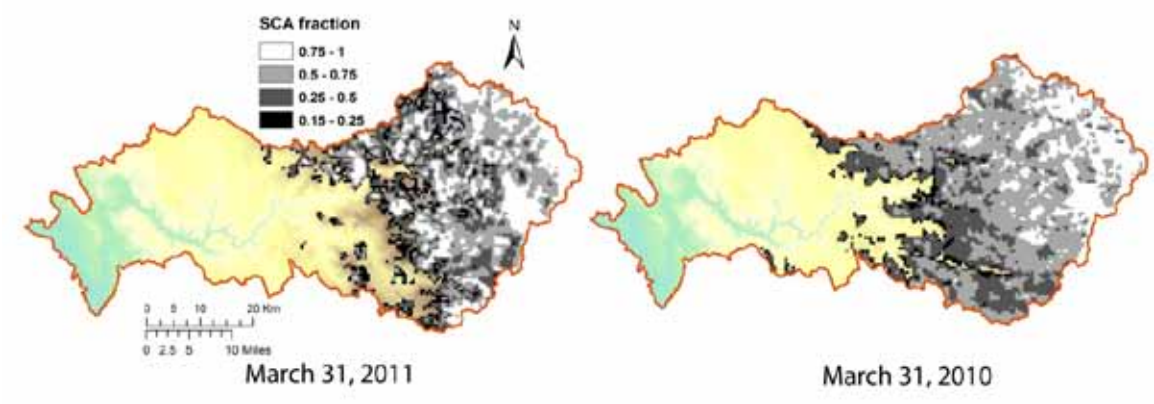
	March 31, 2011	April 1
1500-1800	50%	23%
1800-2100	58%	46%
2100-2400	65%	59%
2400-2700	69%	65%
2700-3000	79%	74%

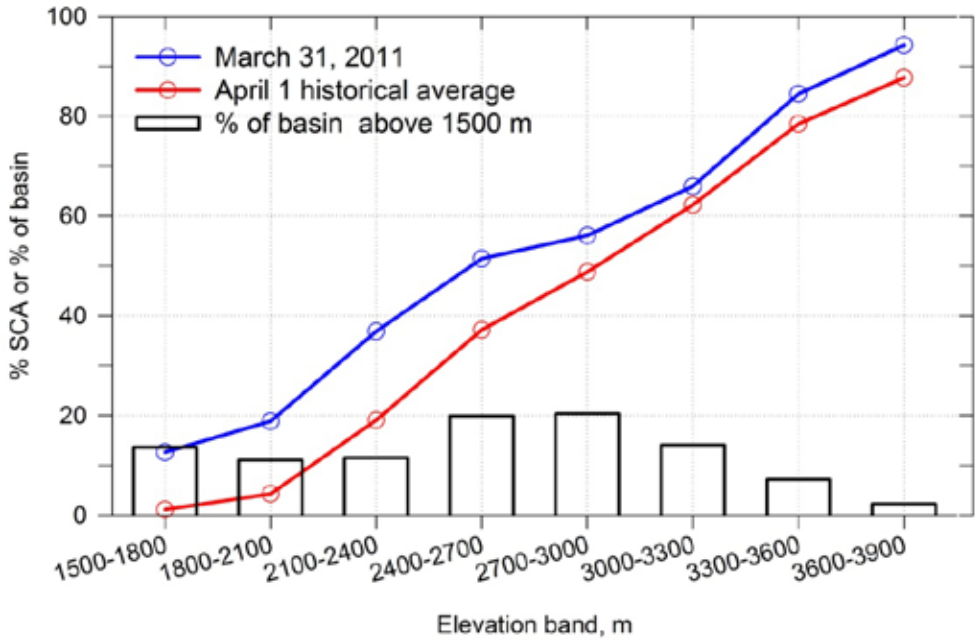
Figure 3(b). SCA over the **American River** basin on March 31, 2011 and 2010. On April 1, 2011 basin-wide SWE was 189% of the April 1 historical average (based on basin-wide snow course data). April 1, 2010 was 98% of the April 1 historical average. Graphical and tabular data represent average % SCA by 300 m (1000 foot) elevation bands over the **American River** basin for March 31, 2011 and the April 1 historical averages based over the MODIS period 2001-2010.



	March 31, 2011	April 1
1500-1800	28%	9%
1800-2100	44%	28%
2100-2400	65%	55%
2400-2700	67%	62%
2700-3000	70%	69%
3000-3300	82%	79%
3300-3600	90%	87%
3600-3900	91%	88%

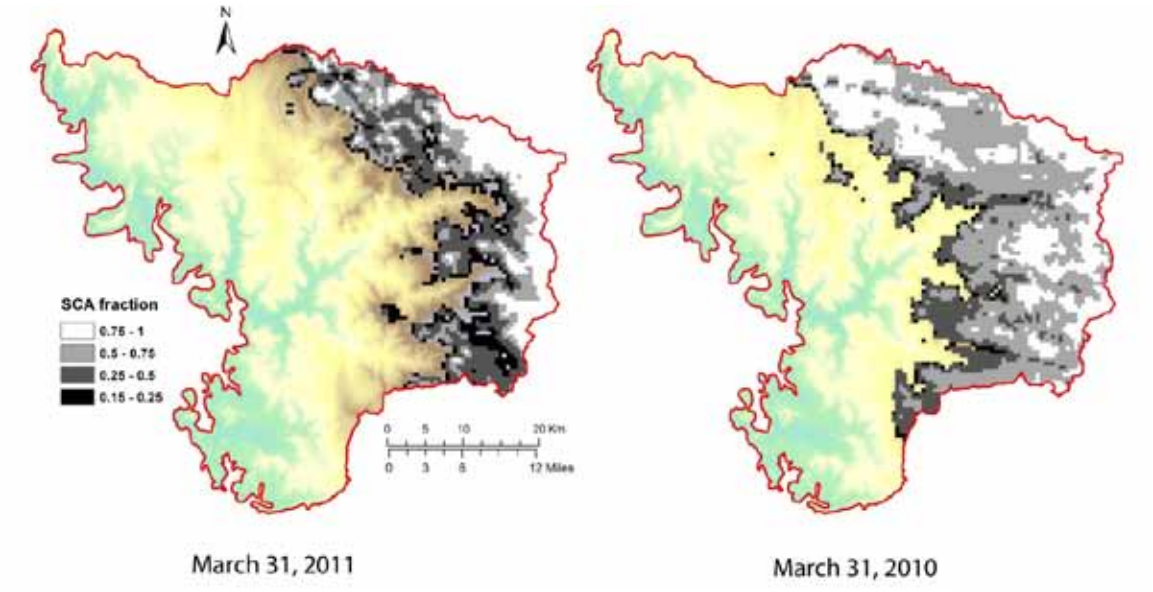
Figure 3(c). SCA over the **Tuolumne River** basin on March 31, 2011 and 2010. On April 1, 2011 basin-wide SWE was 178% of the April 1 historical average (based on basin-wide snow course data). April 1, 2010 was 107% of the April 1 historical average. Graphical and tabular data represent average % SCA by 300 m (1000 foot) elevation bands over the **Tuolumne River** basin for March 31, 2011 and the April 1 historical averages based over the MODIS period 2001-2010.

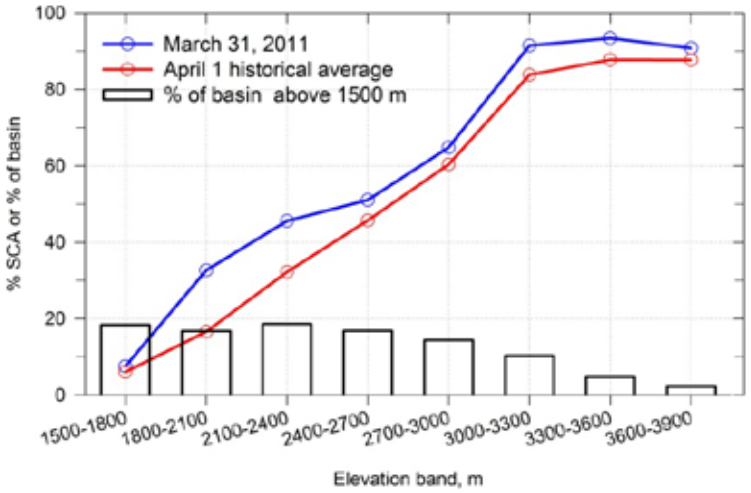




	March 31, 2011	April 1,
1500-1800	13%	1%
1800-2100	19%	4%
2100-2400	37%	19%
2400-2700	51%	37%
2700-3000	56%	49%
3000-3300	66%	62%
3300-3600	84%	78%
3600-3900	94%	88%

Figure 3(d). SCA over the **Merced River** basin on March 31, 2011 and 2010. On April 1, 2011 basin-wide SWE was 172% of the April 1 historical average (based on basin-wide snow course data). April 1, 2010 was 109% of the April 1 historical average. Graphical and tabular data represent average % SCA by 300 m (1000 foot) elevation bands over the **Merced River** basin for March 31, 2011 and the April 1 historical averages based over the MODIS period 2001-2010.





	March 31, 2011	April 1
1500-1800	8%	6%
1800-2100	33%	17%
2100-2400	46%	32%
2400-2700	51%	46%
2700-3000	65%	60%
3000-3300	91%	84%
3300-3600	93%	88%
3600-3900	90%	86%

Figure 3(e). SCA over the **Kaweah River** basin on March 31, 2011 and 2010. On April 1, 2011 basin-wide SWE was 175% of the April 1 historical average (based on basin-wide snow course data). April 1, 2010 was 138% of the April 1 historical average. Graphical and tabular data represent average % SCA by 300 m (1000 foot) elevation bands over the **Kaweah River** basin for March 31, 2011 and the April 1 historical averages based over the MODIS period 2001-2010.