

## **Snow Coverage Area for the Sierra Nevada –May 1, 2007**

The following analysis of **Snow Covered Area (SCA)** is derived from MODIS (Moderate Resolution Imaging Spectroradiometer) aboard NASA's Terra and Aquas 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 100% (e.g. 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 and Figure 2 showing the change in SCA between March 31, 2007 and April 30, 2007. Figures 3 (a-d) focuses on the **American, Tuolumne, Merced, and Kaweah** River basins. Additional basins will be added throughout the year.

These data and analysis are made available by the University of California, Merced, University of California, Santa Barbara, and the National Snow and Ice Data Center (University of Colorado, Boulder) under *NASA Grant NNG04GC52 (REASoN CAN 'Multi-resolution snow products for the hydrologic sciences')*. For further information or comments/suggestions please contact Robert Rice ([rrice@ucmerced.edu](mailto:rrice@ucmerced.edu) or (209)228-4397) or Roger Bales at University of California, Merced.

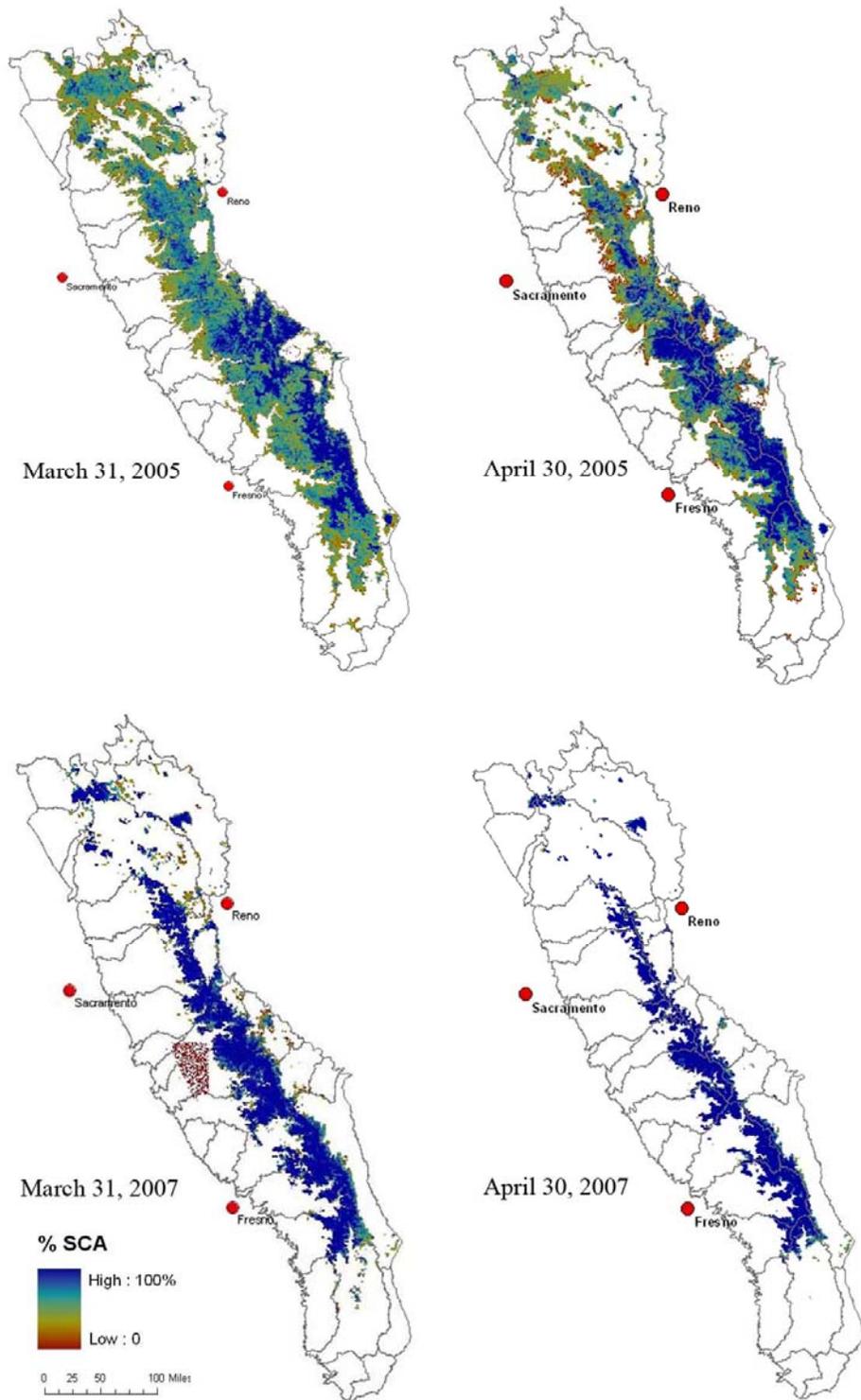


Figure 1. SCA over the **Sierra Nevada** on March 31 and April 30, 2005 and March 31 and April 30, 2007 outlined by the individual watersheds. Evident is the extent of snow cover between March and April of 2005 and 2007 in which the statewide snow water equivalent (SWE) on May 1, 2007 was 20% of the historical April 1 average (based on snow course data), while the May 1, 2005 was 118% of the April 1 average.

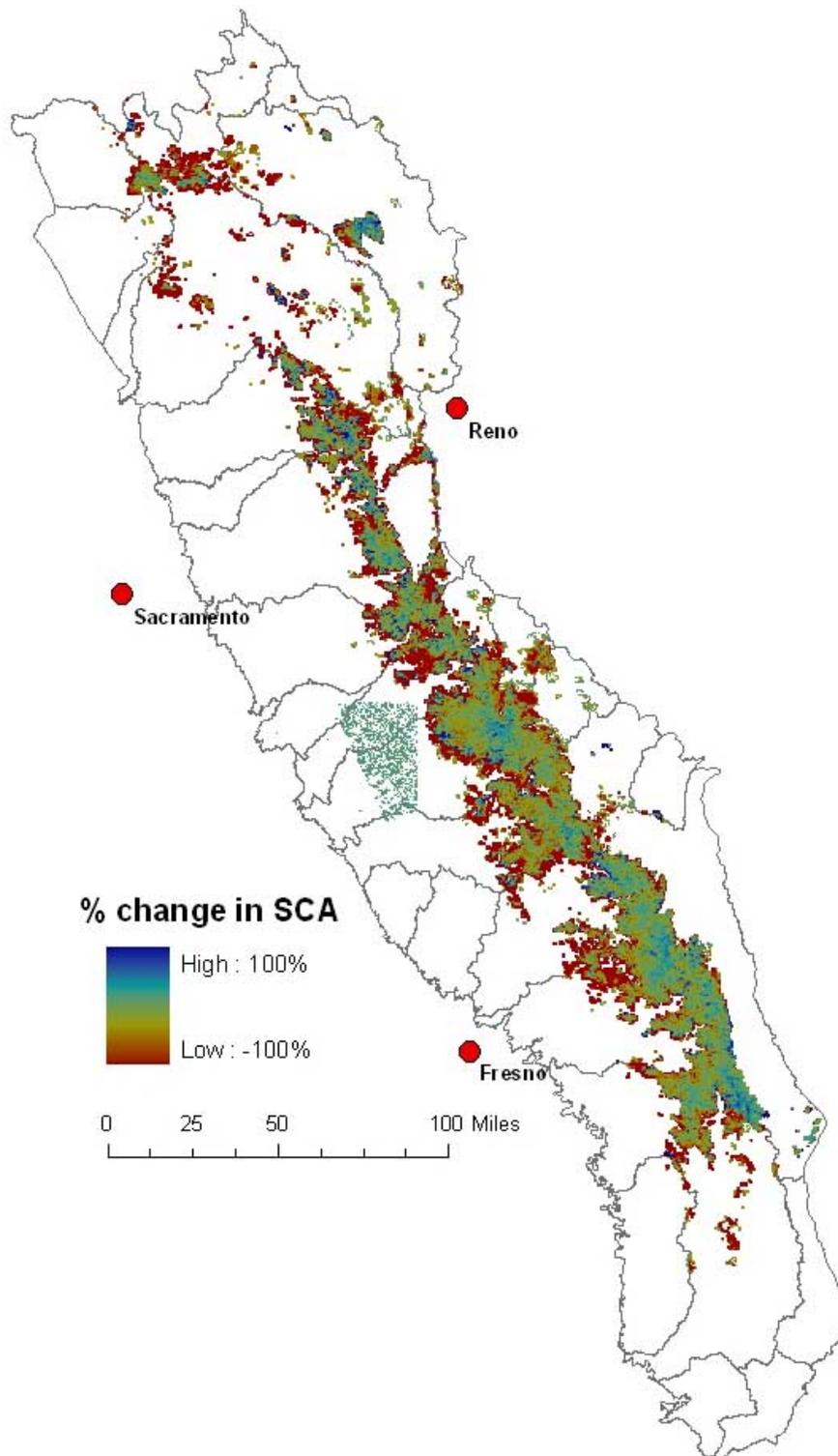
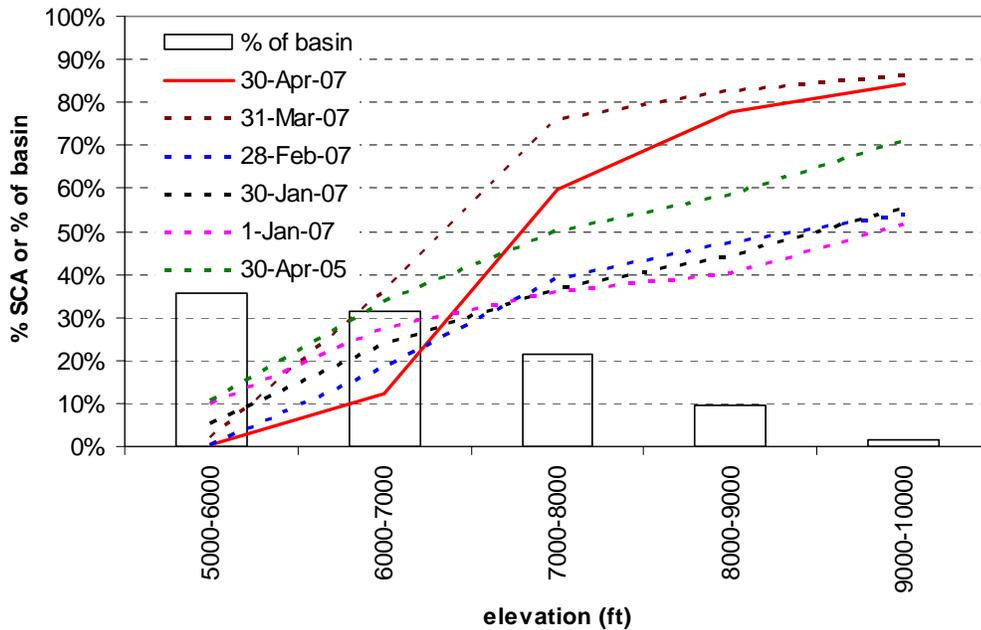
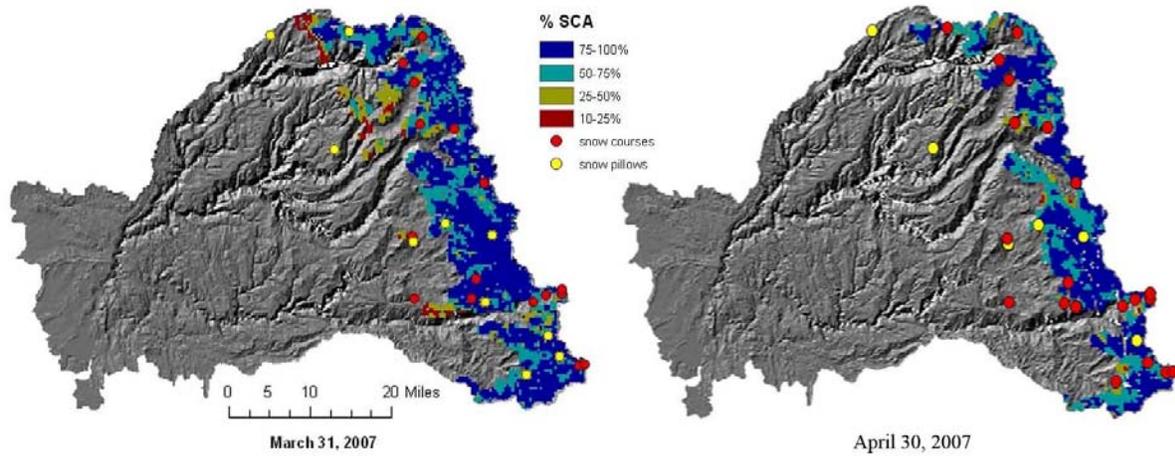
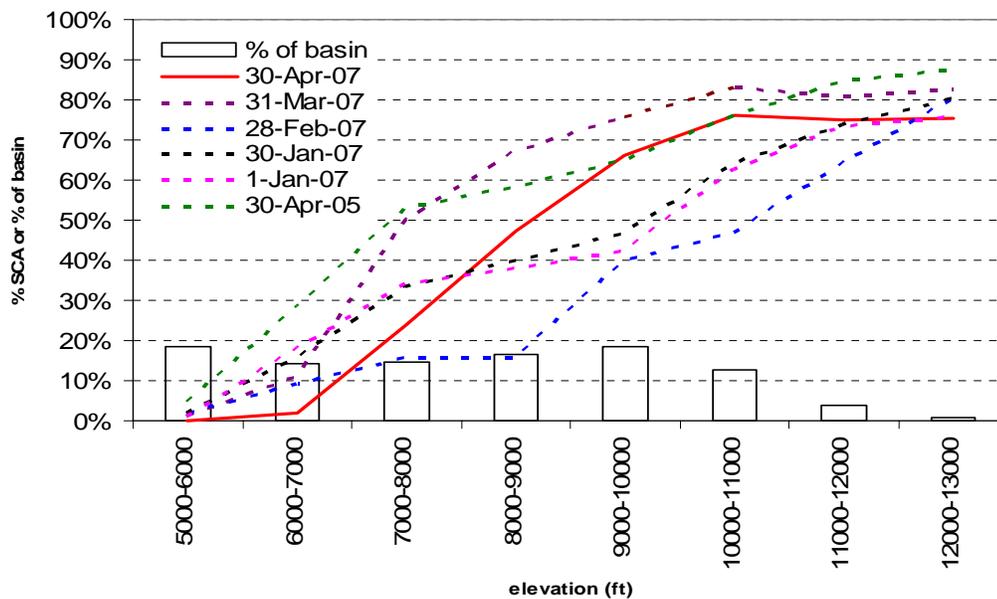
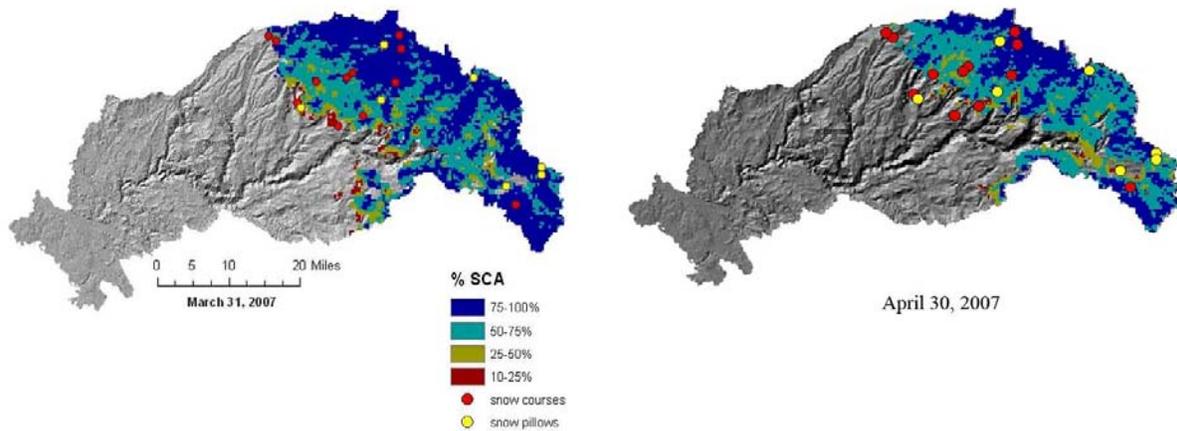


Figure 2. The graphic shows the change in SCA between March 31 and April 30, 2007 in which 100% represents an increase in SCA and -100% represents a decline in SCA across a 500 meter pixel.



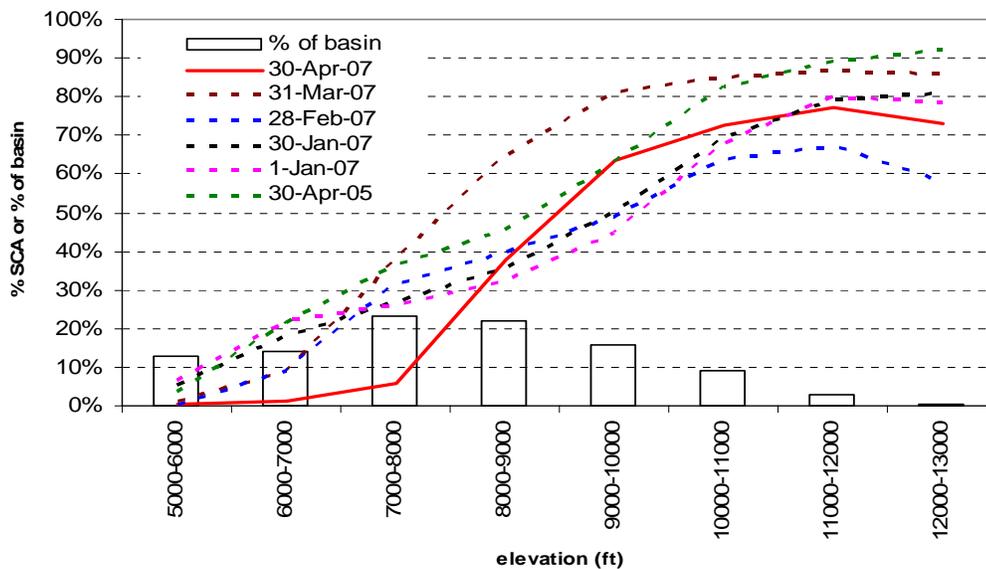
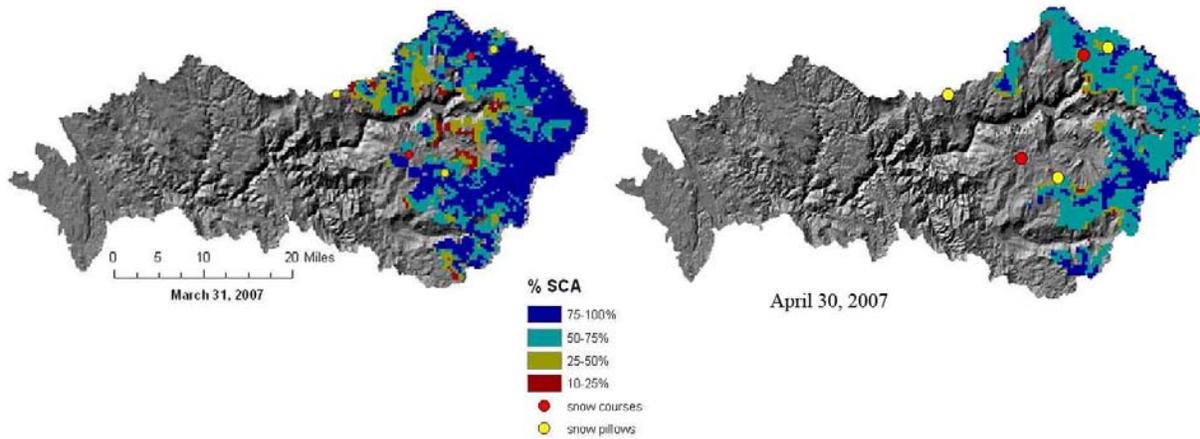
	Apr 30, 2007	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Apr 30, 2005
5000-6000	0%	2%	0%	5%	10%	11%
6000-7000	12%	36%	19%	24%	27%	34%
7000-8000	60%	76%	39%	37%	36%	50%
8000-9000	78%	83%	47%	44%	40%	59%
9000-10000	84%	86%	54%	56%	52%	71%

Figure 3(a). SCA over the **American River Basin** on March 31 and April 30, 2007. On April 1, 2007 basin-wide SWE was 38% of the April 1 historical average (based on basin-wide snow course data), while May 1, 2007 was 14% of the April 1 historical average. In addition, on May 1, 2005, SWE was 108% of the April 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the American River Basin from January – April 2007 and April 30, 2005.



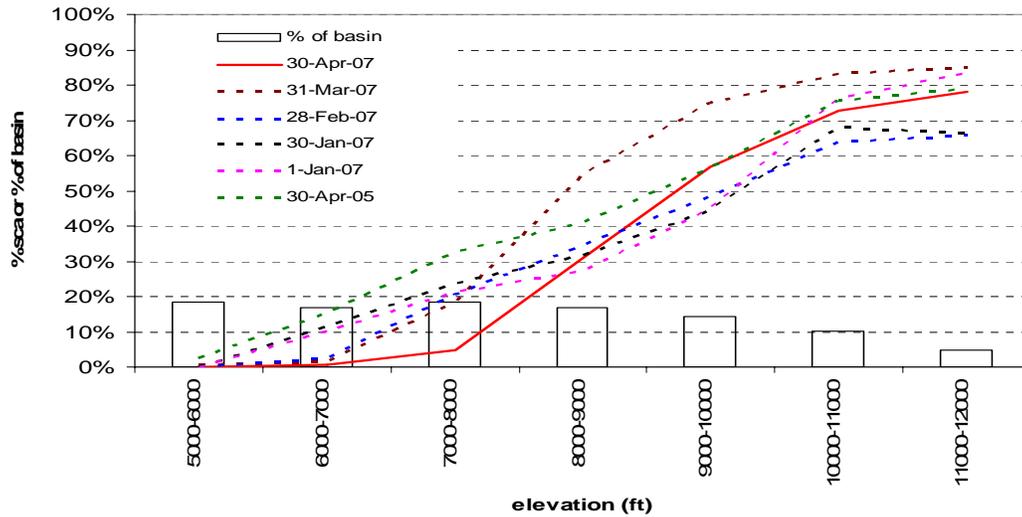
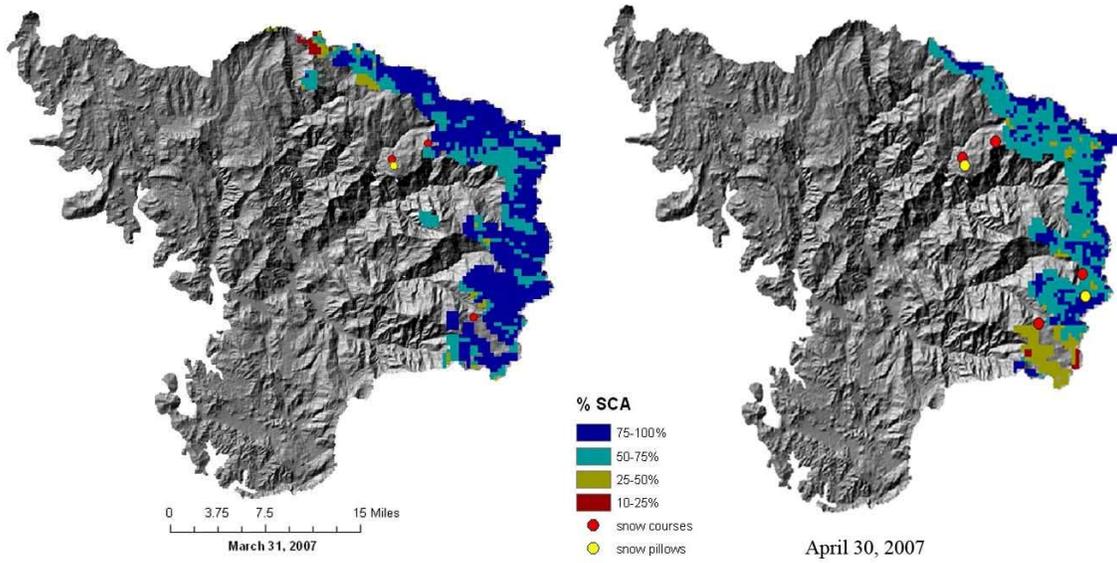
	Apr 30, 2007	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Apr 30, 2005
5000-6000	0%	1%	2%	2%	1%	5%
6000-7000	2%	11%	9%	16%	18%	28%
7000-8000	24%	50%	16%	34%	34%	53%
8000-9000	47%	67%	16%	40%	38%	58%
9000-10000	66%	76%	40%	47%	42%	65%
10000-11000	76%	83%	47%	64%	63%	76%
11000-12000	75%	81%	64%	74%	74%	85%
12000-13000	75%	83%	80%	80%	76%	88%

Figure 3(b). SCA over the **Tuolumne River** Basin on March 31 and April 30, 2007. On April 1, 2007 basin-wide SWE was 46% of the April 1 historical average (based on basin-wide snow course data), while May 1, 2007 was 24% of the April 1 historical average. In addition, on May 1, 2005, SWE was 146% of the April 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Tuolumne River Basin from January – April 2007 and April 30, 2005.



	Apr 30, 2007	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Apr 30, 2005
5000-6000	0%	1%	0%	6%	7%	4%
6000-7000	1%	9%	9%	18%	22%	22%
7000-8000	6%	38%	31%	27%	26%	37%
8000-9000	38%	65%	40%	36%	32%	46%
9000-10000	64%	81%	49%	50%	45%	63%
10000-11000	73%	85%	64%	69%	68%	83%
11000-12000	77%	87%	67%	79%	80%	89%
12000-13000	73%	86%	58%	81%	78%	92%

Figure 3(c). SCA over the **Merced River** Basin on March 31 and April 30, 2007. On April 1, 2007 basin-wide SWE was 45% of the April 1 historical average (based on basin-wide snow course data), while May 1, 2007 was 23% of the April 1 historical average. In addition, on May 1, 2005, SWE was 158% of the April 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Merced River Basin from January – April 2007 and April 30, 2005.



	Apr 30, 2007	Mar 31, 2007	Feb 28, 2007	Jan 30, 2007	Jan 1, 2007	Apr 30, 2005
5000-6000	0%	1%	0%	0%	0%	3%
6000-7000	1%	2%	2%	11%	10%	15%
7000-8000	5%	18%	21%	24%	21%	33%
8000-9000	31%	54%	35%	32%	27%	41%
9000-10000	57%	75%	48%	44%	45%	57%
10000-11000	73%	83%	64%	68%	76%	76%
11000-12000	78%	85%	66%	66%	84%	79%

Figure 3(d). Figure 3(c). SCA over the **Kaweah River** Basin on March 31 and April 30, 2007. On April 1, 2007 basin-wide SWE was 41% of the April 1 historical average (based on basin-wide snow course data), while May 1, 2007 was 19% of the April 1 historical average. In addition, on May 1, 2005, SWE was 129% of the April 1 historical average. Graphical and tabular data represent average % SCA by 1000 foot elevation bands over the Kaweah River Basin from January – April 2007 and April 30, 2005.