

## Northern Hemisphere snow variations with season and elevation using GIS and AMSR-E data

Mukesh Singh Boori<sup>1,2</sup> and Ralph R. Ferraro<sup>2</sup>

<sup>1</sup>National Research Council (NRC) Visiting Scientist, USA

<sup>2</sup>NOAA/NESDIS/STAR/ Satellite Climate Studies Branch and Cooperative Institute for Climate and Satellites (CICS), ESSIC, University of Maryland, USA

Seasonal snow cover and properties in the Northern Hemisphere (NH) was examined in this study using AMSR-E multispectral passive microwave satellite derived snow water equivalent (SWE) and the digital elevation model (DEM) for the different seasons (January, April, July and October months) from 2007 to 2011. The methodology involves conversion of satellite SWE data into 6 snow classes, computation of NDSI, determination of the boundary between snow classes from spectral response data and threshold slicing of the image data. Accuracy assessment of AMSR-E snow products was accomplished using Geographic Information System (GIS) techniques. The coldest month has all six snow type classes due to snow pack growth whereas the summer months only contain residual snow at the highest elevations. Sharp season-to-season differences were noted. The final results show the greatest snow cover extent in January whereas total snow in April is 60%, July 3% and in October near to 25%. In terms of inter-seasonal variations during the study period, the minimum (1.53 million km<sup>2</sup>) snow cover extent was observed in July 2008 and the maximum (60.0 km<sup>2</sup>) in January 2010. In terms of elevation, the maximum snow extent exists between 0 to 2000m in winter and near to 5000m in summer. Finally, this study shows how satellite remote sensing can be useful for the long-term observation of the intra and inter-annual variability of snowpacks in rather inaccessible regions and providing useful information on a critical component of the hydrological cycle, where the network of meteorological stations is deficient.

### Biography

Dr. Mukesh Singh Boori is a scientist in the Satellite Climate Studies Branch, NOAA, College Park - MD, USA. He has done his PhD from Federal University-RN (UFRN), Natal -RN, Brazil. I have 5 Scholarships, 13 International Publications, 2 Books, 8 Conference Presentations, Visited 4 Continents and lot of international Trainings/Awards.

msboori@gmail.com