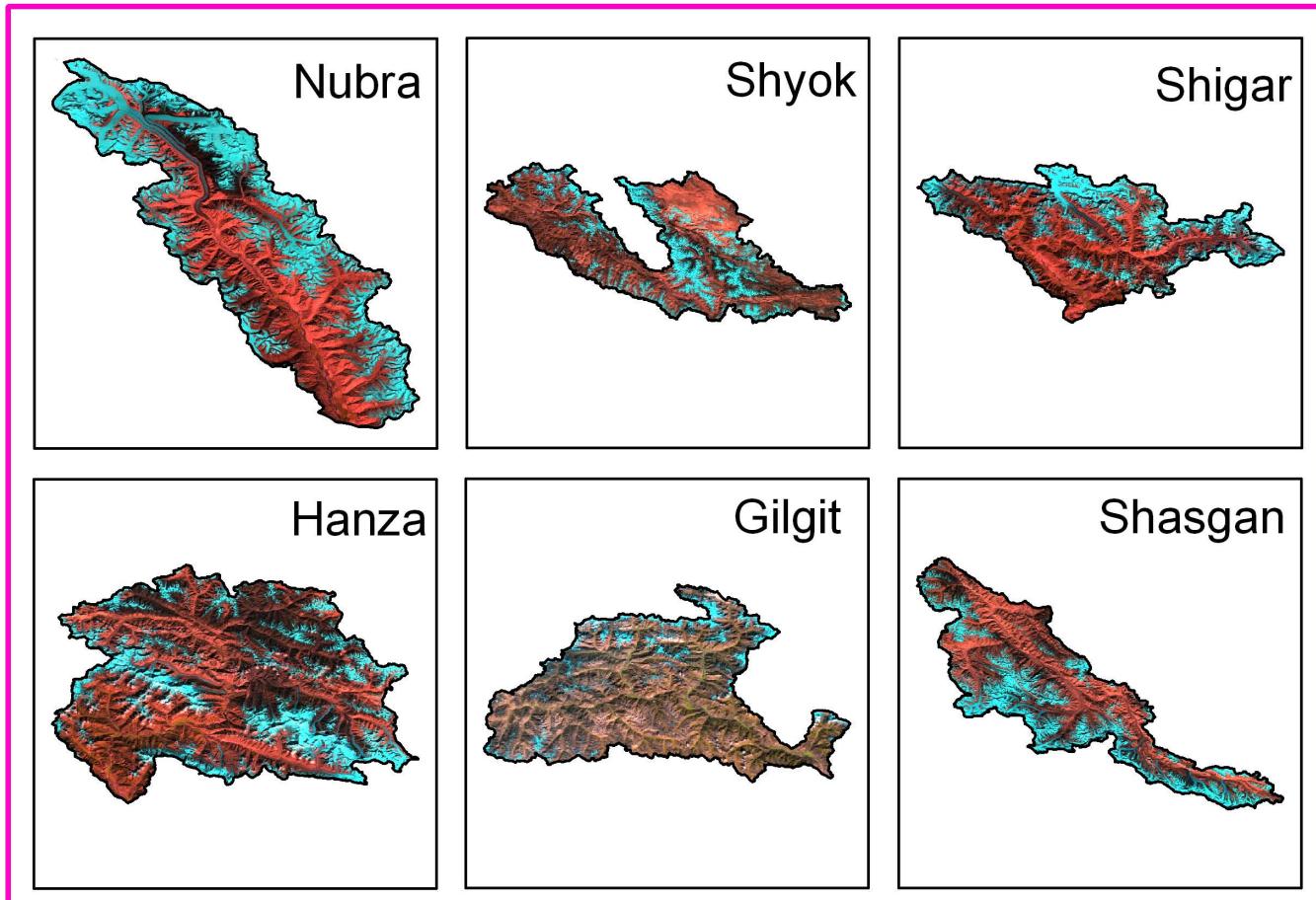


# **SNOW COVER ATLAS OF INDUS BASIN**

**Sub basins: Nubra, Shyok, Shigar, Hanza, Gilgit and Shasgan**

**(A Joint Project of Indian Space Research Organisation and  
Ministry of Environment and Forests, Govt. of India)**

**Year : 2013-14**



**Volume II**



**Remote Sensing Applications Centre U. P.  
Lucknow - 226021**

**and**

**Space Applications Centre (ISRO)  
Ahmedabad - 380015**

**February, 2015**

# **SNOW COVER ATLAS OF THE INDUS BASIN**

**Sub-basins: Nubra, Shyok, Shigar, Hanza, Gilgit and Shasgan**

**(A Joint Project of Indian Space Research Organization and  
Ministry of Environment and Forests, Govt. of India)**

**Year 2013-14**

**Volume II**



**Remote Sensing Applications Centre U. P.  
Lucknow - 226021**

**Space Applications Centre (ISRO)  
Ahmedabad-380015**

**February 2015**

**SPACE APPLICATIONS CENTRE (ISRO), AHMEDABAD - 380015****DOCUMENT CONTROL AND DATA SHEET**

Report Number	SAC/EPSA/GSAG/GSD/SGP/SN/ 100 /2015
Month and year of publication	February 2015
Title	Snow cover Atlas of the Indus basin
Type of Report	Scientific Report
No. of pages	140
No. of figures, Charts & Tables	110, 18 & 12
Authors	Team members
No. of References	9
Originating Unit	Geo Sciences Division, Marine, Geo and Planetary Sciences Group, Earth, Ocean, Atmosphere, Planetary Sciences and Applications area, Space Applications Centre (ISRO), Ahmedabad-15
Abstract	This atlas gives subbasin-wise distribution of snow cover in the Indus basin from October 2013 to June 2014. The subbasins included in this report are Nubra, Shyok, Shigar, Hanza, Gilgit and Shasgan. The areal extent of snow cover was estimated in fully automatic mode using Normalized Difference Snow Index (NDSI) based algorithm. For this purpose AWIFS sensor of Resourcesat satellite was used. This atlas gives snow cover products, statistics and seasonal snow depletion curve. It is expected that this data will be useful for hydrological and climatological applications.
Key words	Snow cover, NDSI, AWIFS, depletion curve, Nubra, Shyok, Shigar, Hanza, Gilgit and Shasgan basins.
Security Classification	Unrestricted
Distribution	Among concerned

Authors (Team Members)

Space Applications centre (ISRO)

Ahmedabad – 380015

B. P. Rathore

S. K. Singh

I. Bahuguna

A. S. Rajawat

Manab Chakraborty

Remote Sensing Applications centre, U. P.

Lucknow - 226021

Diwakar Pandey

S. K. S. Yadav

Ram Chandra

Anjani K. Tangri

Rajiva Mohan

## **CONTENTS**

	<b>Page No.</b>
1. INTRODUCTION	1
2. STUDY AREA	2
3. DATA USED	2
4. NORMALISED DIFFERENCE SNOW INDEX	2
5. SNOW COVER MONITORING ALGORITHM	3
6. RESULTS AND DISCUSSIONS	4
NUBRA BASIN	8
SHYOK BASIN	31
SHIGAR BASIN	53
HANZA BASIN	76
GILGIT BASIN	98
SHASGAN BASIN	120

## **1. Introduction**

Snow covers almost 40 per cent of the Earth's land surface during Northern Hemisphere winter. This makes albedo and areal extent of snow as important component of the Earth's radiation balance (Foster and Chang, 1993). In addition, large areas in the Himalayas are also covered by snow during winter. Area of snow can change significantly during winter and spring. This can affect stream flow for rivers originating in the higher Himalayas. All the rivers originating from higher Himalayas receive almost 30-50 % of annual flow from snow and glacier melt run off (Agarwal et al., 1983). In addition, snow pack ablation is highly sensitive to climatic variation. Increase in atmospheric temperature can influence snowmelt and stream runoff pattern (Kulkarni et al., 2002). Therefore, mapping of the areal extent and reflectance of snow are important parameter for various climatological and hydrological applications. In addition, extent of snow cover can also be used as input for numerous other applications.

Mapping and monitoring of seasonal snow cover using field methods are normally very difficult in a mountainous terrain, like the Himalayas. Therefore, remote sensing techniques have been extensively used for snow cover monitoring. Snow cover monitoring using satellite images were started by using the TIROS-1 satellite from April 1960 (Singer and Popham 1963). Since then, the potential for operational satellite-based mapping has been enhanced by the development of higher temporal frequency and satellite sensors with higher spatial resolution. In addition, satellites with better radiometric resolutions, such as NOAA have been used successfully for snow mapping (Hall et al., 1995). This is possibly due to the distinct spectral reflectance characteristics of snow in visible and near infrared regions. India has launched series of Indian Remote Sensing satellite (IRS) to study the different earth resources. Previously launched satellites have flown with many sensors having different spatial, temporal and spectral resolutions. Recently launched RESOURCESAT-1 satellite has three different sensors namely LISS III, LISS IV & AWIFS with different spatial, temporal and spectral resolutions as desired for different applications. AWIFS (Advanced Wide Field Sensor) is an advanced version of earlier Indian satellite sensor WiFS (Wide Field Sensor) with improved spectral and spatial resolutions maintaining the same repetitivity. There are a series of other polar orbiting satellites, like Landsat, NOAA and MODIS etc., which have provided information on different aspects of

snow. Geo-stationary satellites also proved their utility in mapping/monitoring the snow-covered regions. Information generated from satellite observations has been extensively used for snowmelt runoff modeling (Kulkarni et al., 1997).

## **2. Study Area:**

This Atlas gives distribution of snow cover in six subbasins of the Indus basin. These are Nubra, Shyok, Shigar, Hanza, Gilgit and Shasgan sub basins. Locations of these basins are shown in Figure 1.

## **3. Data used:**

AWiFS data from October 2013 to June 2014 were used in this study.

## **4. Normalised Difference Snow Index (NDSI):**

In general, the reflectance of snow is high at the red end of the visible spectrum. It tends to decline in the near-infrared region until 1090 nm, where slight gain in reflectance occurs and gives a minor peak at approximately 1090 to 1100 nm. One of the important difficulties in snow cover monitoring is the presence of cloud cover. Cloud has strong reflectivity in visible, NIR and SWIR regions while snow absorbs in SWIR, and this difference can be utilized for snow/cloud discrimination. Normalized Difference Snow Index (NDSI) utilize the normalized ratio of green and SWIR and is used as an automated approach for snow mapping addressing the shadow and cloud problems in snow bound areas.

Normalized Difference Snow Index was calculated using the ratio of green wavelength (band 2) and SWIR (band 5) of AWiFS sensor:

$$\text{Normalized Difference Snow Index(NDSI)} = (\text{band 2} - \text{band 5}) / (\text{band 2} + \text{band 5}) \quad ..(1)$$

To estimate NDSI, DN numbers were converted into reflectance. This involves conversion of digital numbers into the radiance values, known as sensor calibration, and then estimation of reflectance from these radiance values. Various parameters needed for estimating spectral reflectance are maximum and minimum radiances and mean solar exo-atmospheric spectral irradiances in the satellite sensor bands, satellite data acquisition time, solar declination, solar zenith and solar azimuth angles, mean Earth-Sun distance etc. (Markham and Barker, 1987; Srinivasulu and Kulkarni, 2004).

## **5. Snow cover monitoring algorithm**

An algorithm is developed to provide changes in the areal extent of snow (Kulkarni et. al., 2006). Snow extent is estimated at an interval of 5-days and 10-days, depending upon availabilities of AWiFS data. In 5-daily product, snow extent is generated scene-wise. In this product, snow and cloud extents are given. Estimate of cloud is important because, at times, snow is covered by cloud and this may be classified as non-snow area, leading to erroneous conclusions. In 10-daily product, three scenes are analyzed, if available. For example, 10 March product data of 5, 10 and 15 March was used. If any pixel is identified as snow on any one date then this pixel will be classified as snow on final product. This provides snow cover at an interval of 10 days, an important requirement in hydrological applications. Therefore, this product is generated basin-wise. Since this product is using three scenes, probability becomes high that at least in one scene, pixel may be cloud-free and this helps in overcoming problem associated with snow under cloud cover. If three consecutive scenes are not available, then all available scenes in 10 days window was used in the analysis. Differentiation between water and snow is difficult using NDSI image. In addition, separation of snow and water pixels is also difficult based on reflectance due to mountain shadow. Therefore, in the present algorithm, water bodies are marked in pre-winter

season and are masked in the final products during winter. Flow diagram of the algorithm is given in Figure 2.

## **6. Results and discussions**

In this atlas, basin-wise snow cover statistics, maps, and seasonal depletion curves have been provided from October 2013 to June 2014. Snow ablation pattern varies from basin to basin, depending on area altitude distribution in the basins. Many of these sub-basins like Nubra, Shigar and Hanza are highly glacierized, therefore large area under snow and glacier cover was observed even at the beginning and end of accumulation season. In case of Gilgit sub-basin, it is at lower altitude and is less Glacierized so lot of variation in areal extent of snow was observed. In Shasgan and Shyok sub-basins accumulation and ablation were observed through the year.

## **Acknowledgements**

This investigation was carried out under Snow and Glacier Studies Project, a joint initiative of Ministry of Environment and Forest (MoEF) and Department of Space (DOS). The authors are grateful to Shri A. S. Kirankumar, Director, Space Applications Centre, Ahmedabad for continuous guidance and encouragement during the investigation. Authors would like to thank Dr. P. K. Pal, DD, EPSA, SAC for their suggestions and comments on the manuscript.

## **References**

Agarwal, K. G., Kumar, V. and T. Das, 1983, Melt runoff for a subcatchment of Beas basin. In Proceedings of the First National Symposium on Seasonal Snow Cover, New Delhi, India, April 28-30, 43 p.

Foster, J. L. and Chang, A. T. C., 1993, Snow cover, in Atlas of satellite observations related to global change. R. J. Gurney, C.L. Parkinson and J. L. Foster (eds.), Cambridge University Press, Cambridge, pp. 361-370.

Hall, D. K., Riggs, G. A. and Salomonson, V. V., 1995, Development of methods for mapping global snow cover using moderate resolution Image Spectroradiometer data. *Remote Sensing of Environment*, 54, pp. 127-140.

Kulkarni, A. V., Mathur, P., Rathore, B. P., Alex, S., Thakur N. and Kumar, M. 2002, Effect of global warming on snow ablation pattern in the Himalayas. *Current Science*, 83(2), pp 120-123.

Kulkarni A. V., Singh, S. K., Mathur, P. and Mishra, V. D., 2006, Algorithm to monitor snow cover using AWiFS data of RESOURCESAT for the Himalayan region. *International Journal of Remote Sensing*, 27(12), pp 2449-2457.

Kulkarni, A. V., Randhawa, S. S. and Sood, R. K., 1997, A stream flow simulation model in snow covered areas to estimate hydro-power potential: a case study of Malana nala, H.P. Proc. of the First international Conference on Renewable Energy- Small Hydro, Hyderabad, pp 761-770.

Markham, B. L. and Barker, J. L., 1987, Thematic Mapper bandpass solar exoatmospheric irradiances. *International Journal of Remote Sensing*, 8(3), pp 517-523.

Singer, F. S. and Popham, R. W., 1963. Non-meteorological observations from satellite. *Astronautics and Aerospace Engineering* 1(3), 89-92.

Srinivasulu, J. and Kulkarni, A. V., 2004, A satellite based spectral reflectance model for snow and glacier studies in the Himalayan terrain. *Proceedings of the Indian Academy of Science (Earth and Planetary Science)*, 113 (1), pp. 117-128.

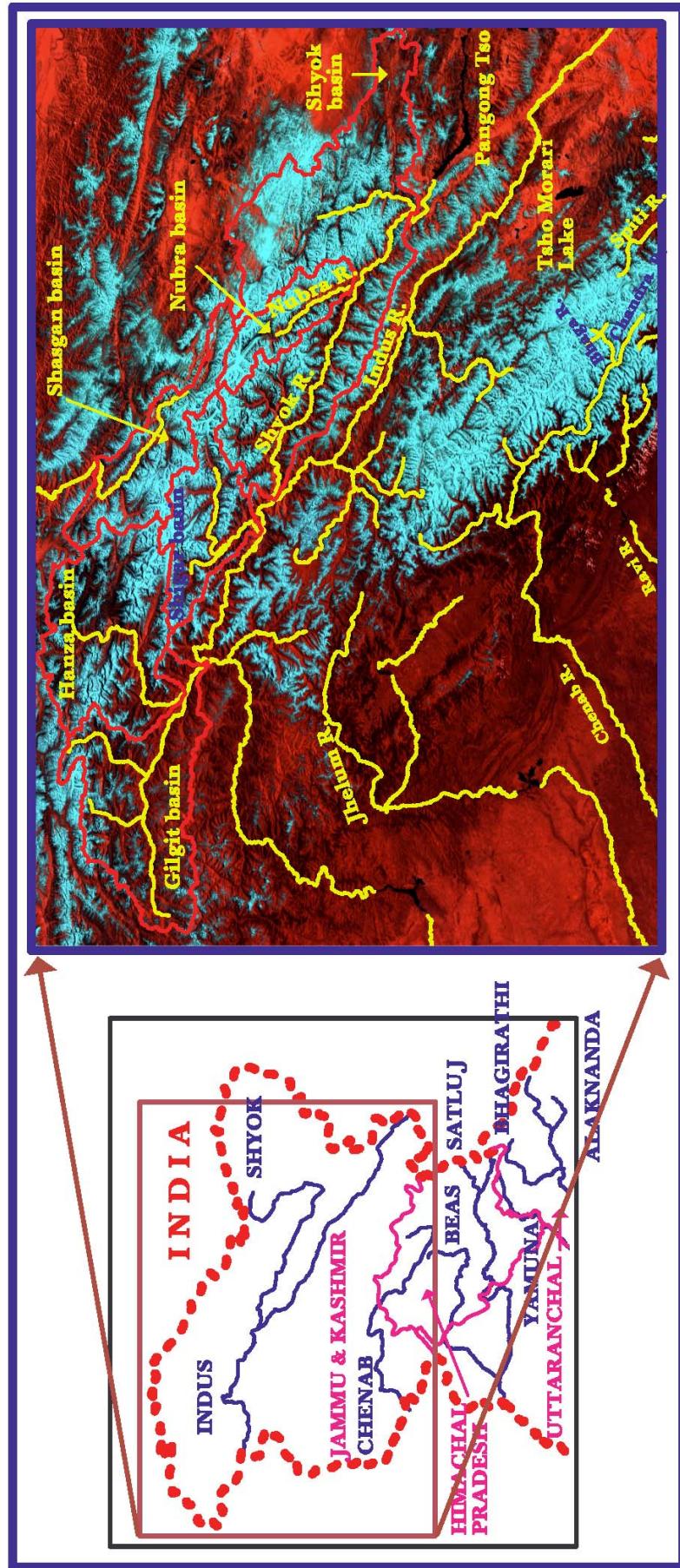
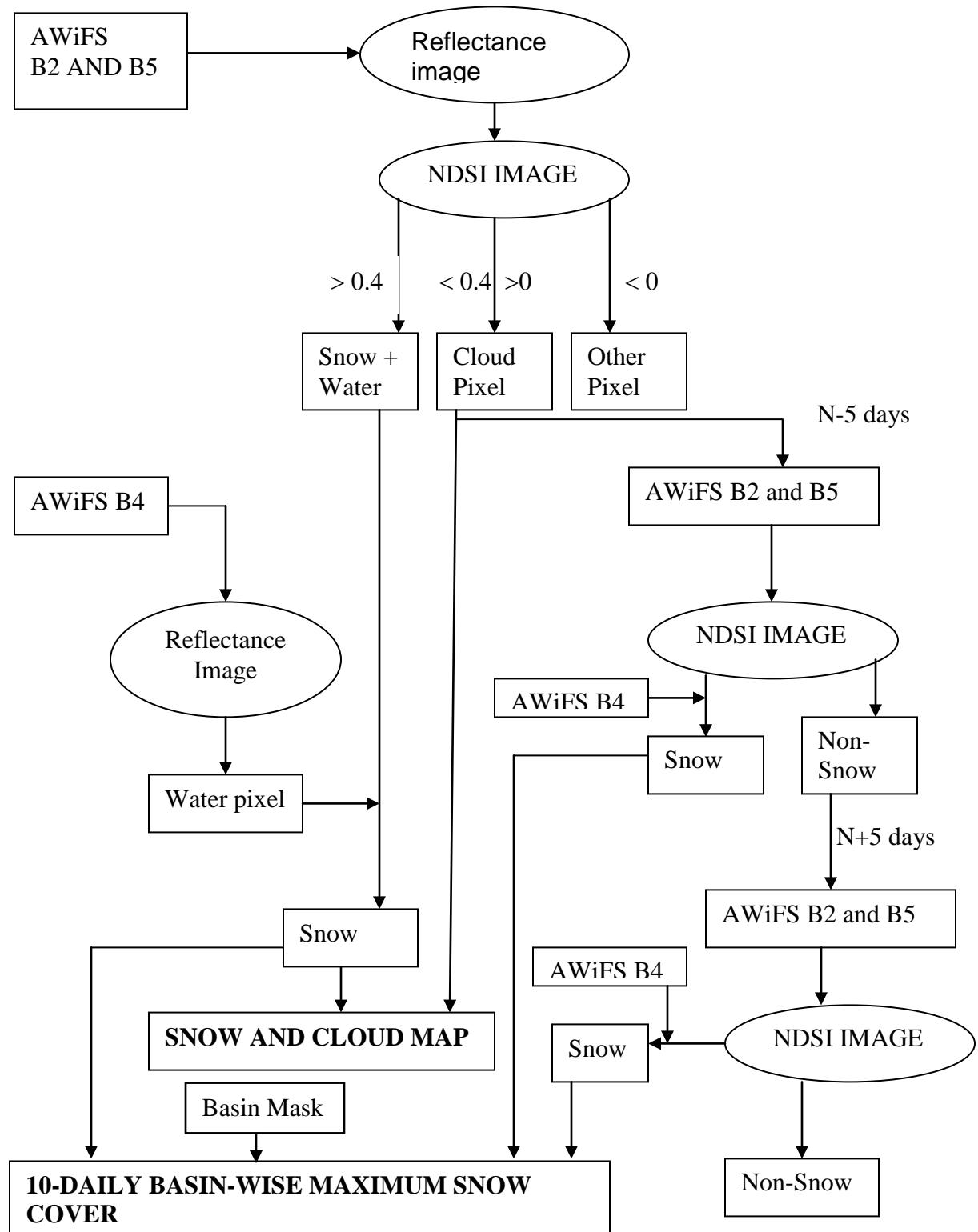


Figure 1: Location map of Nubra, Shyok, Shigar, Hanza, Gilgit and Shasgan sub-basins (Part of Indus basin)



**Figure 2: Algorithm for snow cover mapping using AWiFS data**

### AREAL EXTENT OF SNOW (5 DAILY)

**BASIN NAME: NUBRA**

**BASIN AREA: 4258 sq km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>							
1	04-Oct-13	1940	46	8	20-Oct-13	2596	61
2	06-Oct-13	2001	47	9	21-Oct-13	2686	63
3	08-Oct-13	1830	43	10	23-Oct-13	2428	57
4	09-Oct-13	1797	42	11	25-Oct-13	2373	56
5	11-Oct-13	1959	46	12	26-Oct-13	2475	58
6	16-Oct-13	2629	62	13	28-Oct-13	2070	49
7	18-Oct-13	2259	53				
<b>November 2013</b>							
14	01-Nov-14	2894	68	18	21-Nov-14	3107	73
15	02-Nov-14	3043	71	19	25-Nov-14	1192	28
16	13-Nov-14	2836	67	20	26-Nov-14	2940	69
17	16-Nov-14	3285	77	21	30-Nov-14	2884	67
<b>December 2013</b>							
22	01-Dec-13	2830	66	26	10-Dec-13	3366	79
23	12-Dec-13	3418	80	27	13-Dec-13	3587	84
24	15-Dec-13	3215	76	28	20-Dec-13	3115	73
25	27-Dec-13	3347	79				
<b>January 2014</b>							
29	03-Jan-14	2869	67	33	27-Jan-14	3410	80
30	17-Jan-14	3520	83	34	29-Jan-14	3585	84
31	18-Jan-14	3783	89	35	30-Jan-14	3497	82
32	24-Jan-14	2064	48				
<b>February 2014</b>							
36	08-Feb-14	2989	70	39	17-Feb-14	3418	80
37	10-Feb-14	3049	72	40	23-Feb-14	3593	84
38	15-Feb-14	3075	72				
<b>March 2014</b>							
41	06-Mar-14	3223	76	44	21-Mar-14	3311	78
42	13-Mar-14	3430	81	45	23-Mar-14	3415	80
43	19-Mar-14	3645	86	46	31-Mar-14	3433	81
<b>April 2014</b>							
47	09-Apr-14	3402	80	51	24-Apr-14	3090	73
48	11-Apr-14	3452	81	52	28-Apr-14	3460	81
49	12-Apr-14	3447	81	53	30-Apr-14	3323	78.

50	14-Apr-14	3030	71				
----	-----------	------	----	--	--	--	--

S. No	Date	Snow cover (sq. km)	Snow cover (%)	S. No	Date	Snow cover (sq. km)	Snow cover (%)
<b>May 2014</b>							
54	03-May-14	2887	68	57	10-May-14	3170	74
55	06-May-14	2933	69	58	24-May-14	3042	71
56	08-May-14	2827	66	59	27-May-14	2814	66
<b>June 2014</b>							
60	03-Jun-14	2987	70	65	11-Jun-14	2659	62
61	05-Jun-14	2942	69	66	25-Jun-14	2721	64
62	06-Jun-14	2897	68	67	27-Jun-14	2448	57
63	08-Jun-14	2168	51	68	30-Jun-14	2410.	57
64	10-Jun-14	3020	71				

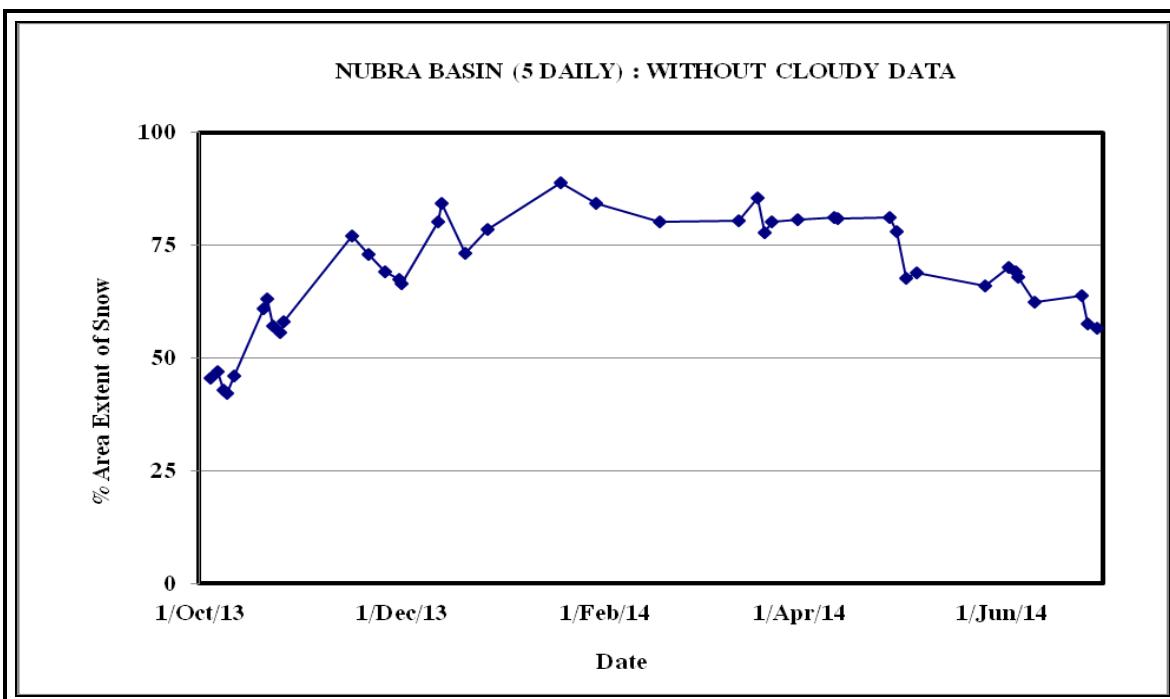
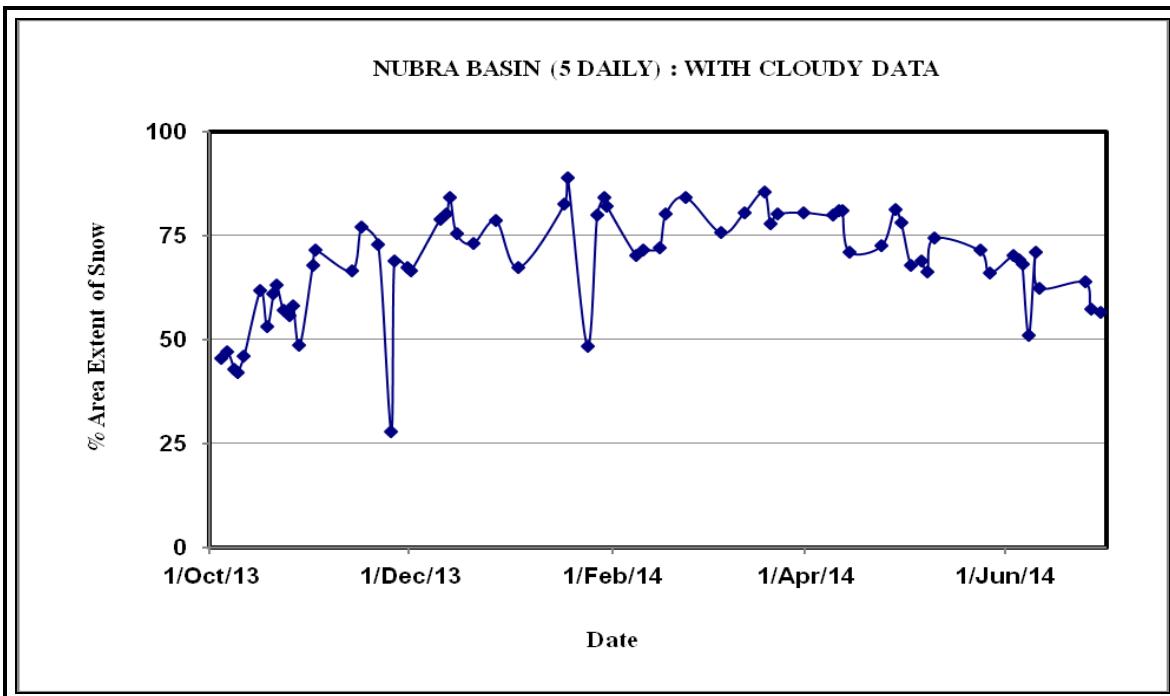
**AREAL EXTENT OF SNOW (10 DAILY)**

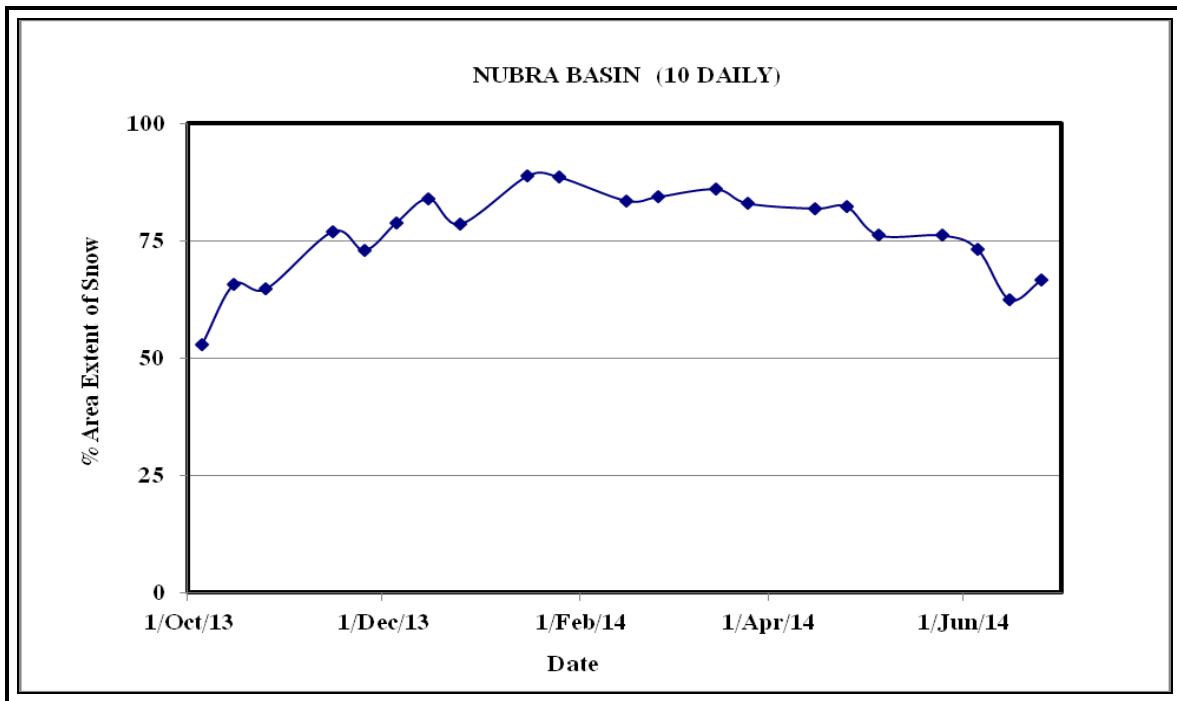
**BASIN NAME: NUBRA**

**BASIN AREA: 4258 sq km**

S No	Date	Snow cover (sq. km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>				<b>November 2013</b>			
1	5-Oct-13	2250	53	4	15-Nov-13	3285	77
2	15-Oct-13	2799	66	5	25-Nov-13	3107	73
3	25-Oct-13	2755	65				
<b>December 2013</b>				<b>January 2014</b>			
6	5-Dec-13	3360	79	9	15-Jan-14	3783	89
7	15-Dec-13	3587	84	10	25-Jan-14	3770	89
8	25-Dec-013	3347	79				
<b>February 2014</b>				<b>March 2014</b>			
11	15-Feb-14	3556	84	13	15-Mar-14	3645	86
12	25-Feb-14	3593	84	14	25-Mar-14	3533	83
<b>April 2014</b>				<b>May 2014</b>			
15	15-Apr-14	3486	82	17	5-May-14	3244	76
16	25-Apr-14	3504	82	18	25-May-14	3242	76
<b>June 2014</b>							
19	5-June-14	3116	73				
20	15-June-14	2659	62				
21	25-June-14	2836	67				

## Snow cover depletion curve





# *SNOW COVER MAP*

## SNOW COVER MAP

: NUBRA BASIN



04 OCTOBER 2013



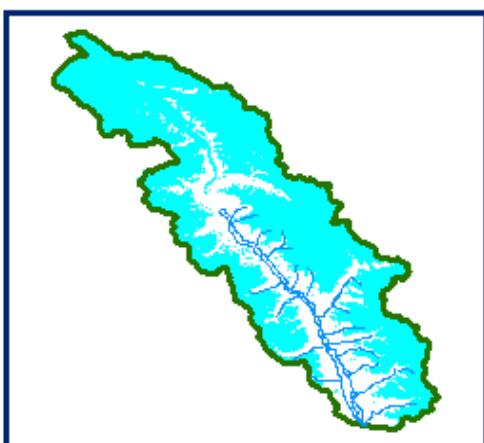
09 OCTOBER 2013



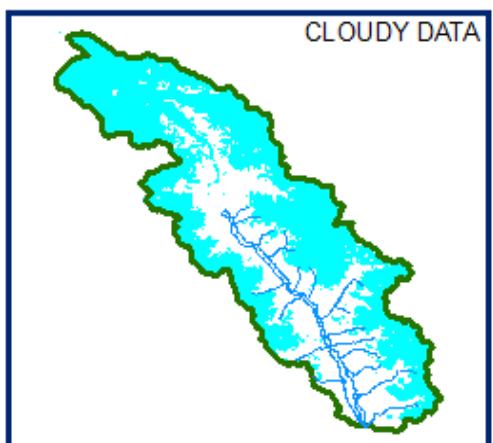
DATA NOT AVAILABLE



20 OCTOBER 2013



23 OCTOBER 2013

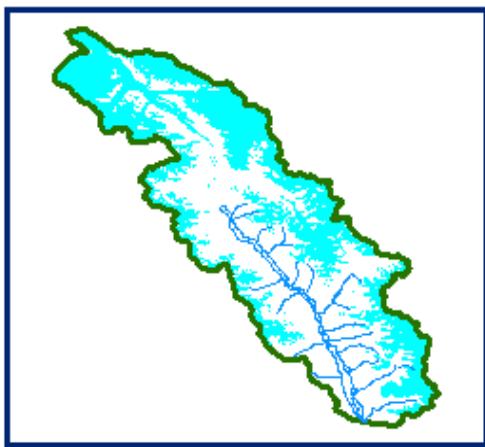


CLOUDY DATA  
28 OCTOBER 2013

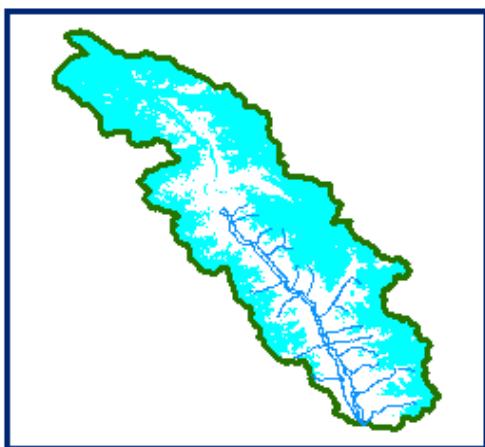
SNOW

0 15 30 60 90 120  
Kilometers

**10 DAILY SNOW COVER MAP: NUBRA BASIN**



DATA USED  
**04 OCTOBER 2013**  
**06 OCTOBER 2013**  
**09 OCTOBER 2013**



DATA USED  
**20 OCTOBER 2013**  
**18 OCTOBER 2013**



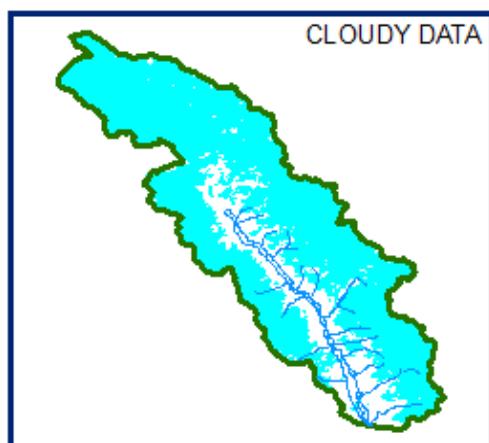
DATA USED  
**21 OCTOBER 2013**  
**28 OCTOBER 2013**  
**25 OCTOBER 2013**



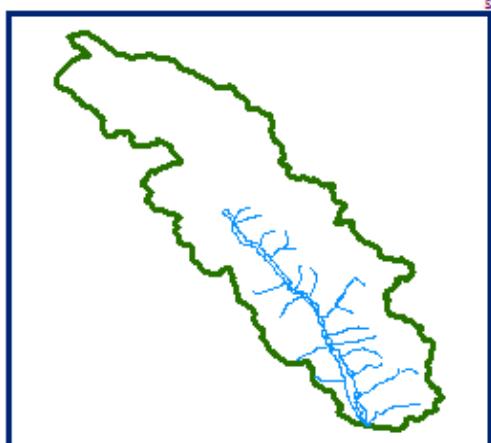
SNOW

0 15 30 60 90 120  
Kilometers

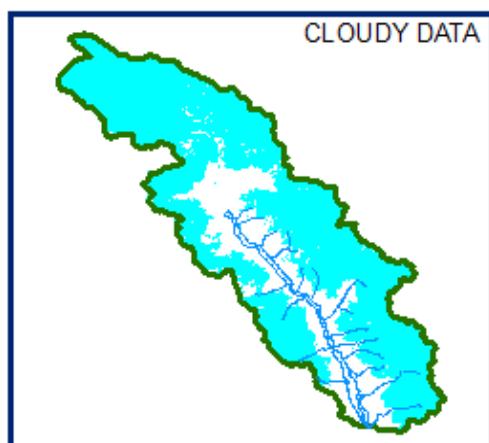
**SNOW COVER MAP : NUBRA BASIN**



01 NOVEMBER 2013



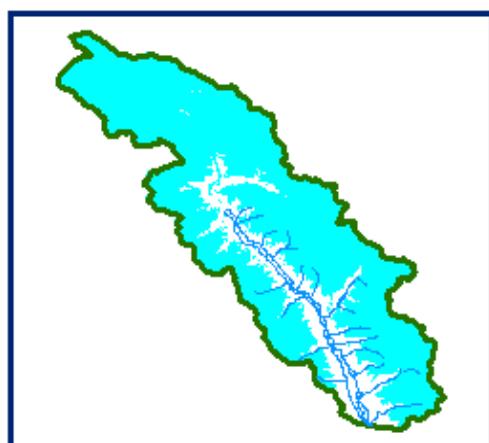
DATA NOT AVAILABLE



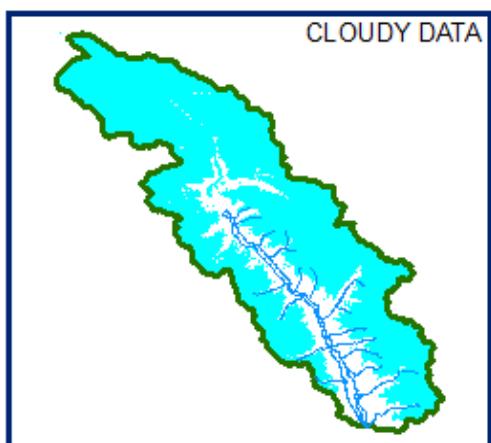
13 NOVEMBER 2013



DATA NOT AVAILABLE



21 NOVEMBER 2013



30 NOVEMBER 2013

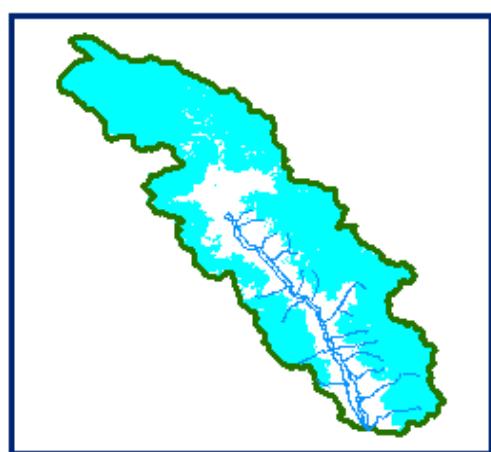
SNOW

0 15 30 60 90 120  
Kilometers

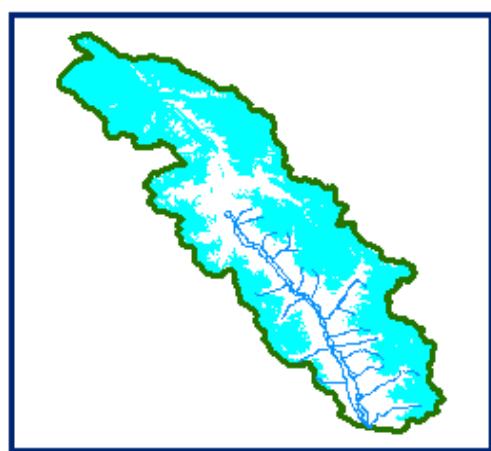
**10 DAILY SNOW COVER MAP: NUBRA BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
13 NOVEMBER 2013**



**DATA USED  
30 NOVEMBER 2013  
25 NOVEMBER 2013  
21 NOVEMBER 2013**

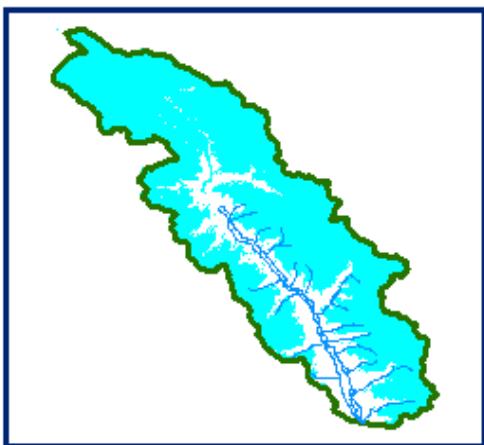


**SNOW**

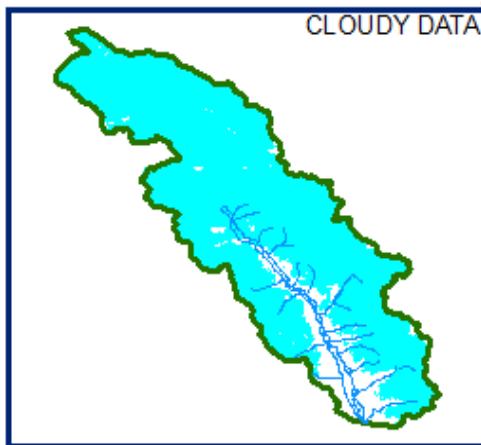
0 15 30 60 90 120  
Kilometers

## SNOW COVER MAP

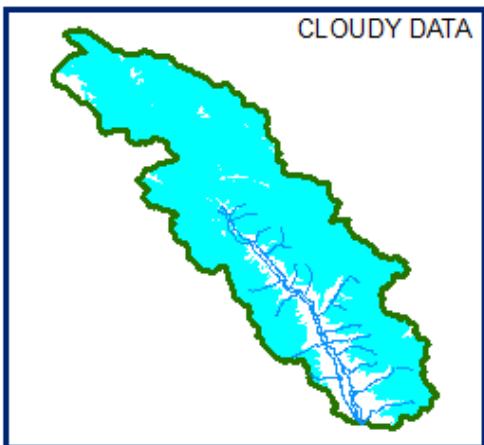
: NUBRA BASIN



01 DECEMBER 2013



10 DECEMBER 2013



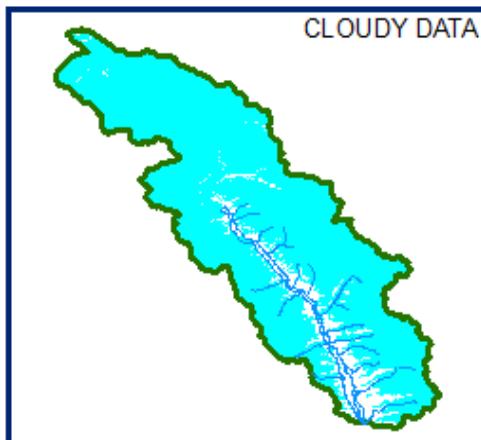
15 DECEMBER 2013



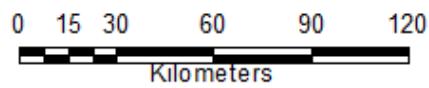
20 DECEMBER 2013



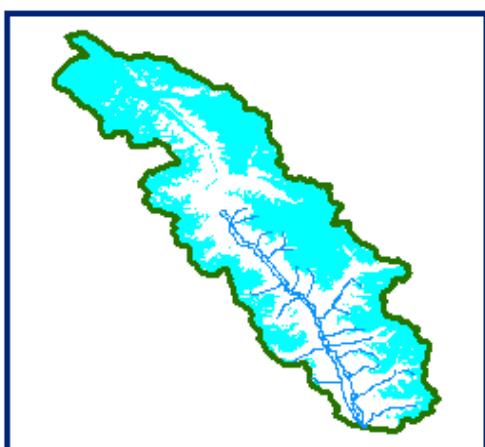
DATA NOT AVAILABLE



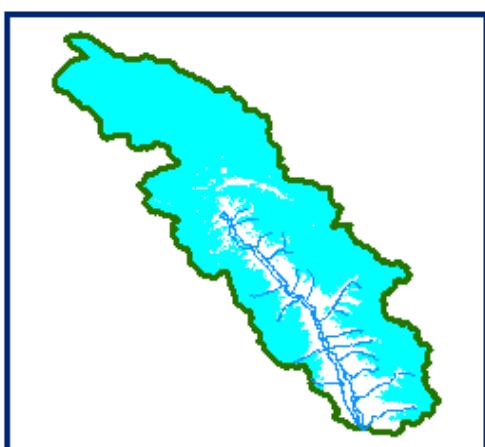
27 DECEMBER 2013



**10 DAILY SNOW COVER MAP: NUBRA BASIN**



**DATA USED**  
**01 DECEMBER 2013**  
**10 DECEMBER 2013**



**DATA USED**  
**20 DECEMBER 2013**  
**12 DECEMBER 2013**  
**15 DECEMBER 2013**



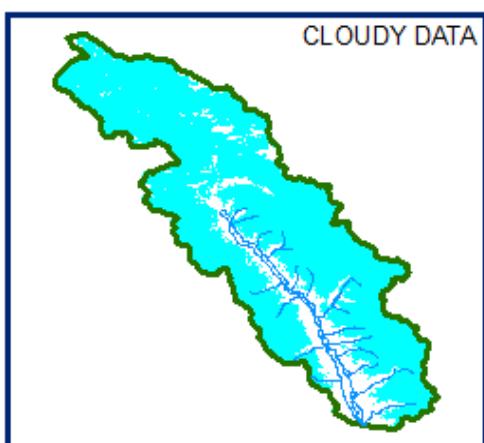
**DATA USED**  
**27 DECEMBER 2013**



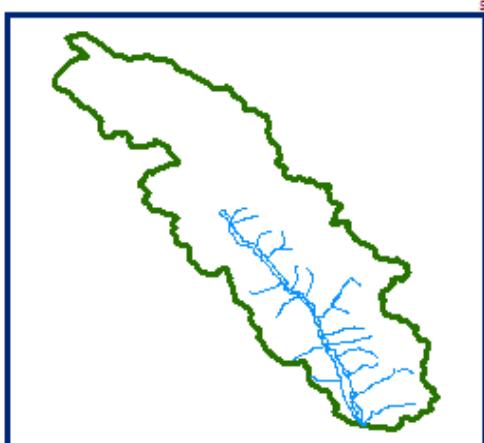
**SNOW**

0 15 30 60 90 120  
Kilometers

**SNOW COVER MAP : NUBRA BASIN**



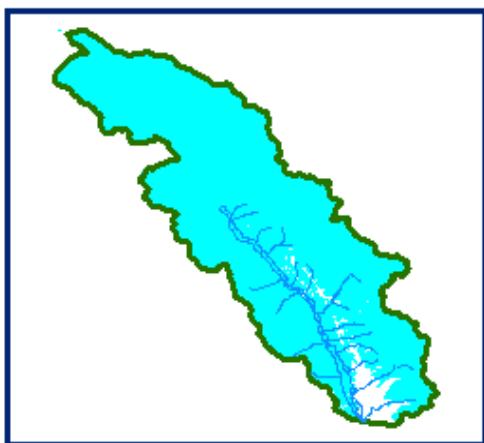
03 JANUARY 2014



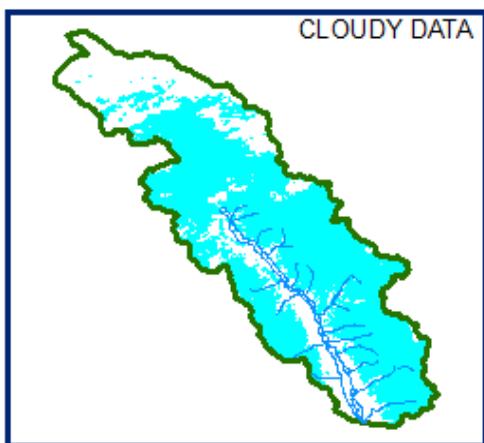
DATA NOT AVAILABLE



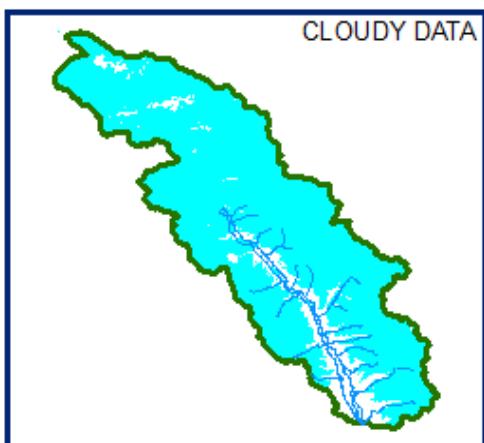
DATA NOT AVAILABLE



18 JANUARY 2014



24 JANUARY 2014

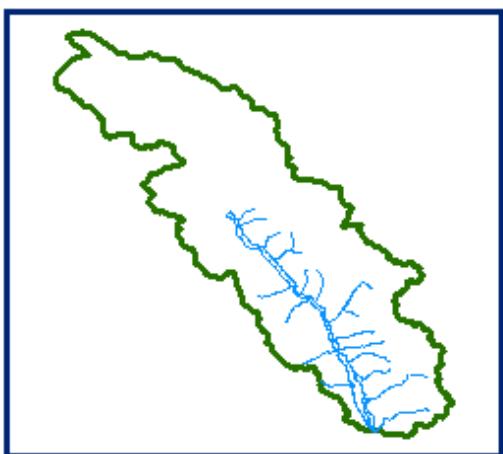


30 JANUARY 2014

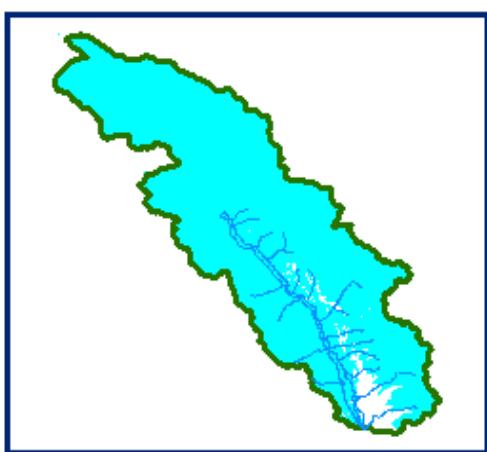
SNOW

0 15 30 60 90 120  
Kilometers

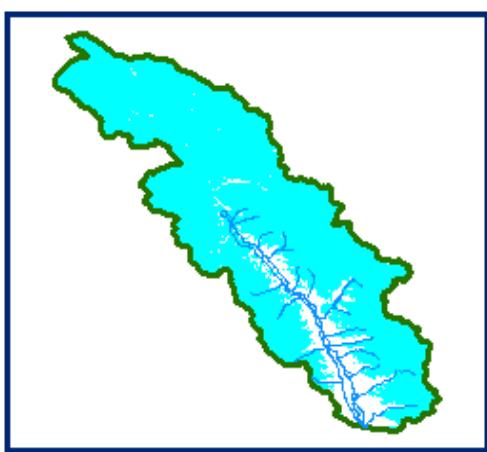
**10 DAILY SNOW COVER MAP: NUBRA BASIN**



**DATA USED  
DATA NOT AVAILABLE**



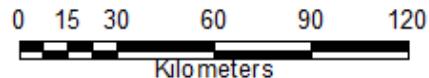
**DATA USED  
18 JANUARY 2014**



**DATA USED  
29 JANUARY 2014  
30 JANUARY 2014  
27 JANUARY 2014**

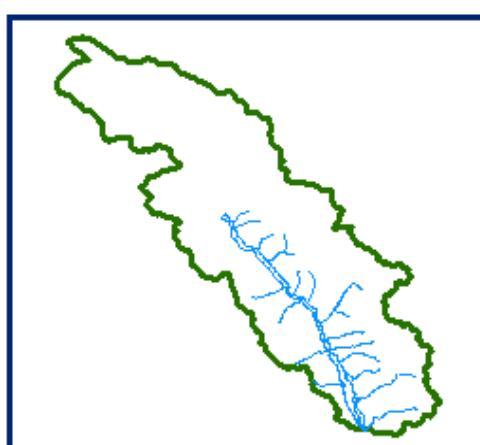
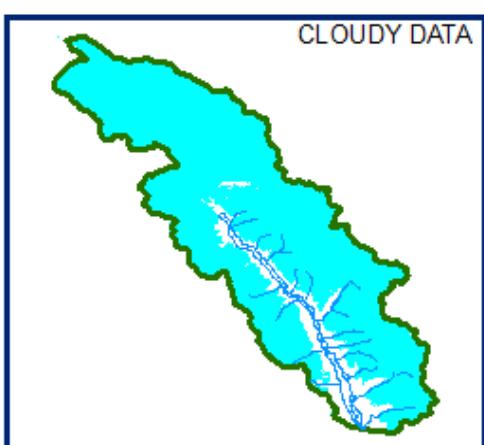
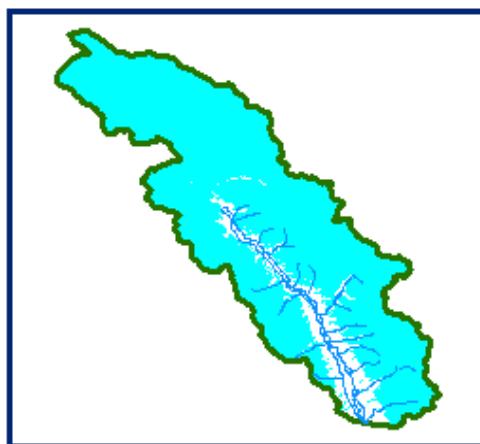
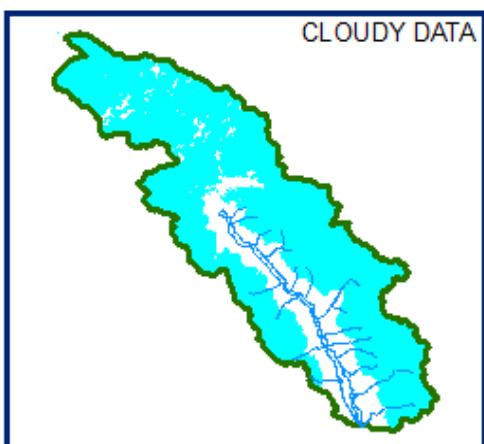
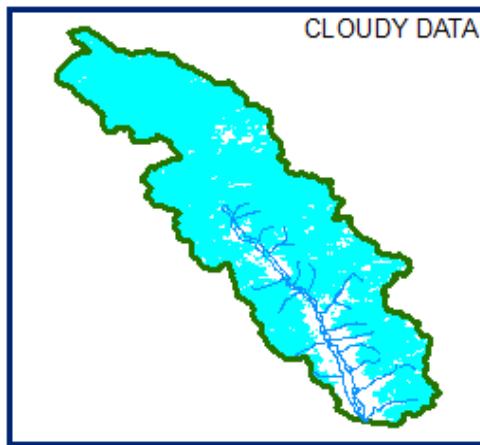


**SNOW**



## SNOW COVER MAP

: NUBRA BASIN



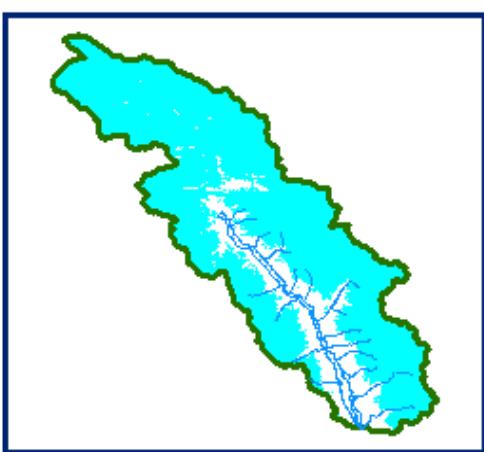
SNOW

0 15 30 60 90 120  
Kilometers

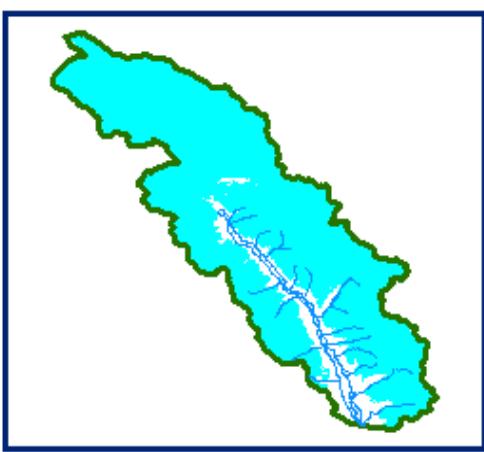
**10 DAILY SNOW COVER MAP: NUBRA BASIN**



**DATA USED  
DATA NOT AVAILABLE**



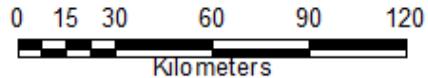
**DATA USED  
17 FEBRUARY 2014  
15 FEBRUARY 2014**



**DATA USED  
23 FEBRUARY 2014**

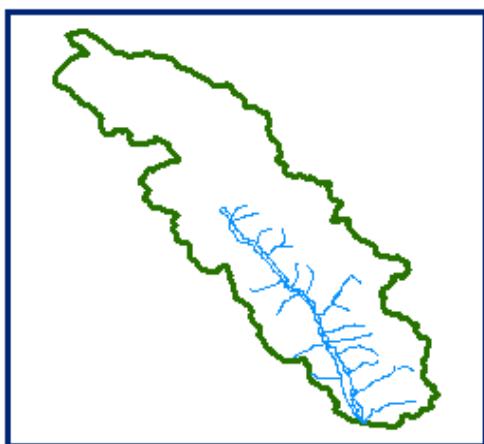


**SNOW**

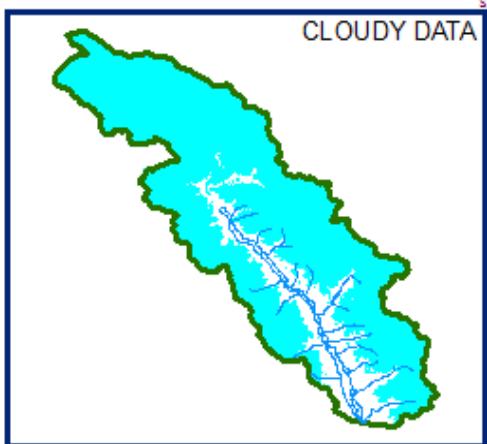


**SNOW COVER MAP**

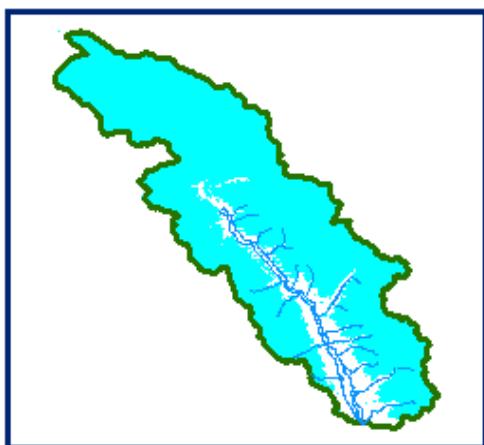
: NUBRA BASIN



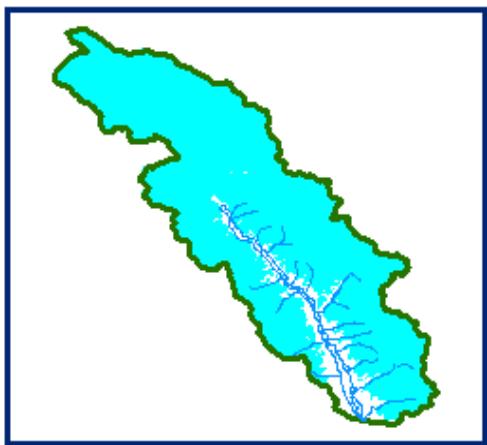
**DATA NOT AVAILABLE**



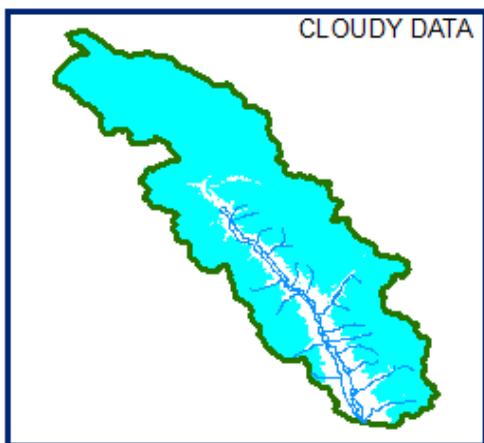
**06 MARCH 2014**



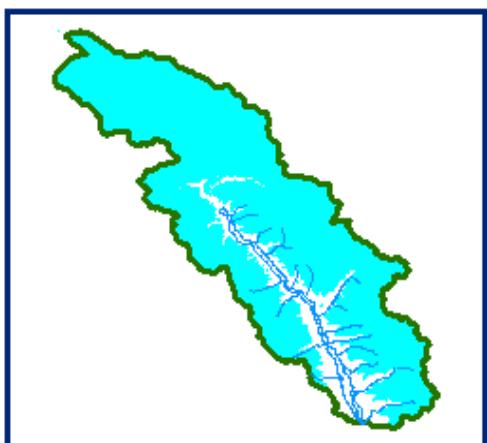
**13 MARCH 2014**



**19 MARCH 2014**



**23 MARCH 2014**



**31 MARCH 2014**

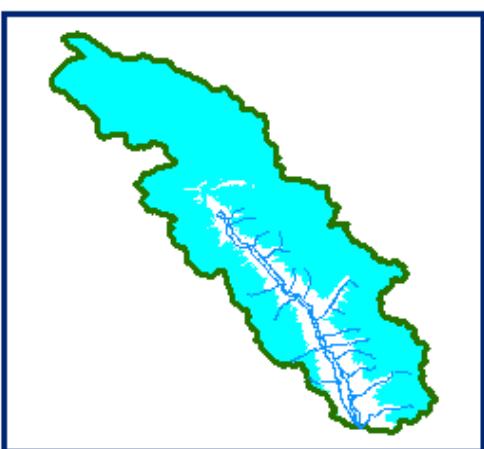
SNOW

0 15 30 60 90 120  
Kilometers

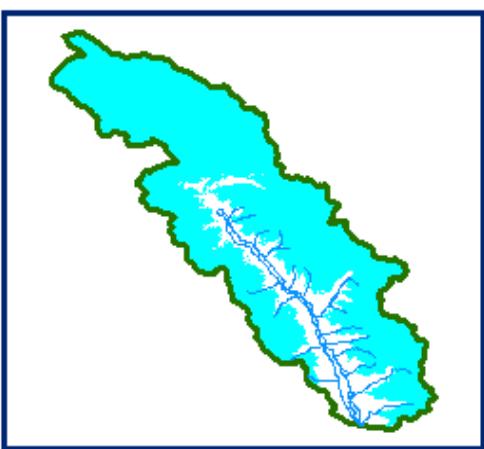
**10 DAILY SNOW COVER MAP: NUBRA BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
13 MARCH 2014  
19 MARCH 2014**



**DATA USED  
31 MARCH 2014  
21 MARCH 2014  
23 MARCH 2014**



0 15 30 60 90 120  
Kilometers

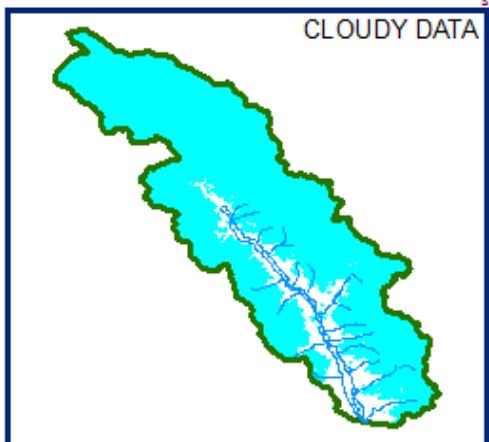
A scale bar at the bottom of the map frame, indicating distances from 0 to 120 kilometers. The text 'Kilometers' is centered below the scale bar.

## SNOW COVER MAP

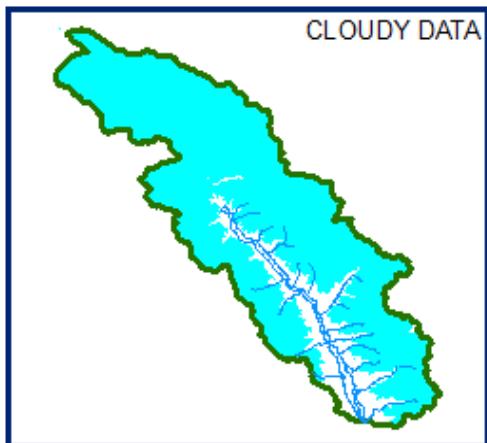
: NUBRA BASIN



DATA NOT AVAILABLE



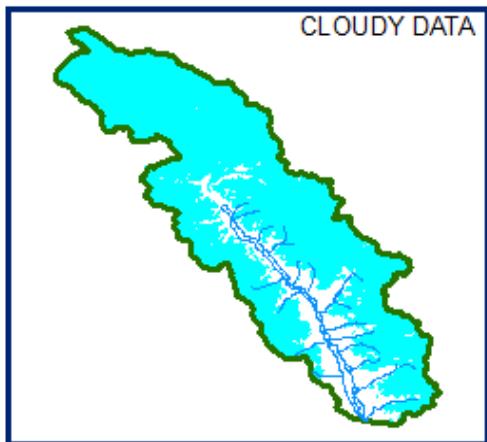
09 APRIL 2014



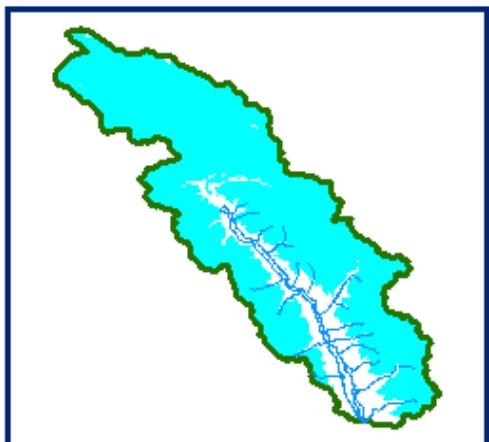
12 APRIL 2014



DATA NOT AVAILABLE



24 APRIL 2014

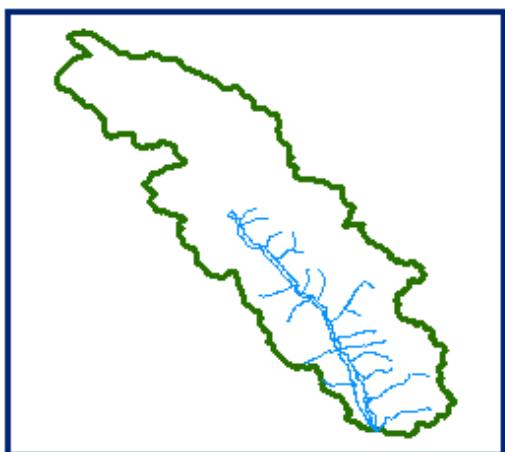


30 APRIL 2014

SNOW

0 15 30 60 90 120  
Kilometers

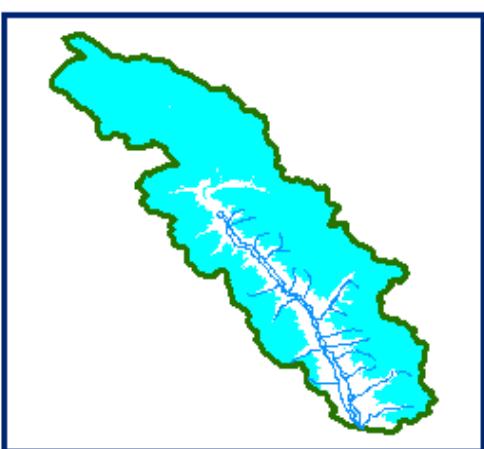
**10 DAILY SNOW COVER MAP: NUBRA BASIN**



**DATA USED  
DATA NOT AVAILABLE**



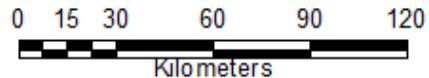
**DATA USED  
11 APRIL 2014  
14 APRIL 2014  
12 APRIL 2014**



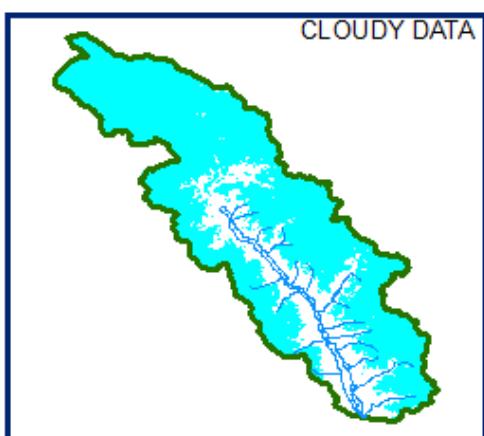
**DATA USED  
28 APRIL 2014  
24 APRIL 2014  
30 APRIL 2014**



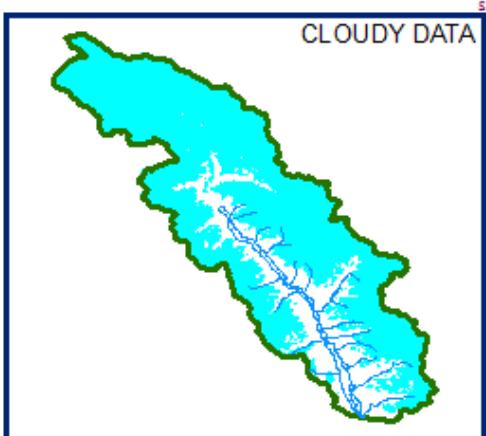
**SNOW**



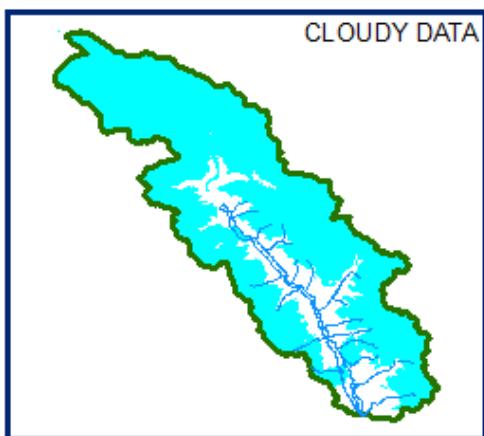
## SNOW COVER MAP : NUBRA BASIN



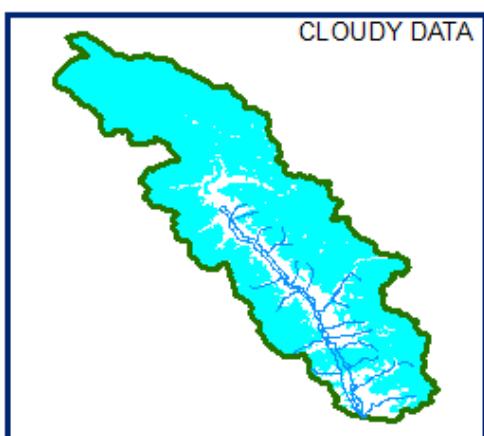
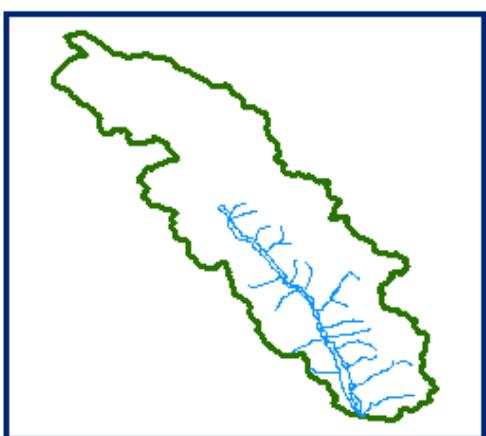
03 MAY 2014



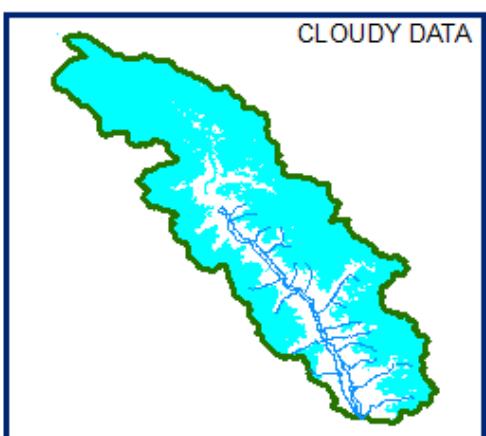
06 MAY 2014



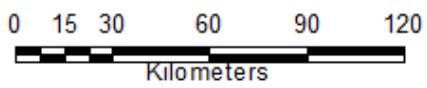
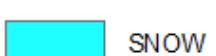
10 MAY 2014



24 MAY 2014



27 MAY 2014



## 10 DAILY SNOW COVER MAP: NUBRA BASIN



DATA USED  
06 MAY 2014  
10 MAY 2014  
03 MAY 2014



DATA USED  
DATA NOT AVAILABLE



DATA USED  
27 MAY 2014  
24 MAY 2014



SNOW

0 15 30 60 90 120  
Kilometers

## SNOW COVER MAP

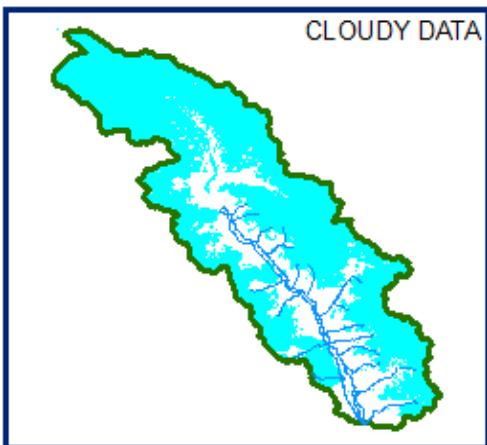
: NUBRA BASIN



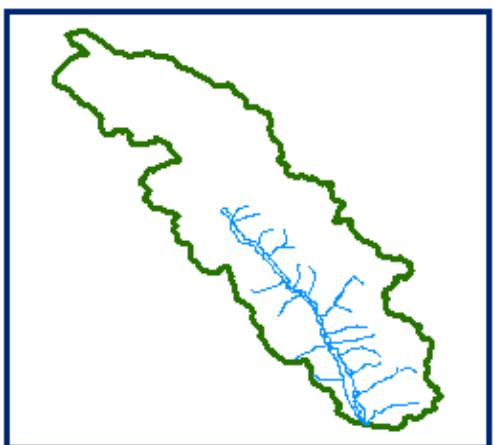
03 JUNE 2014



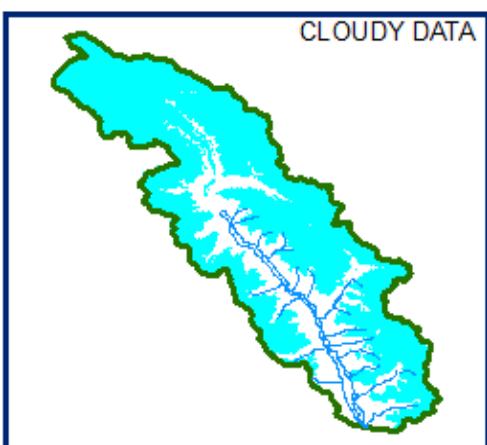
06 JUNE 2014



11 JUNE 2014



DATA NOT AVAILABLE



25 JUNE 2014



30 JUNE 2014

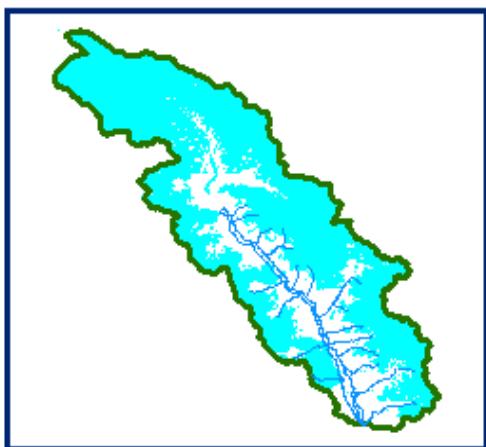
SNOW

0 15 30 60 90 120  
Kilometers

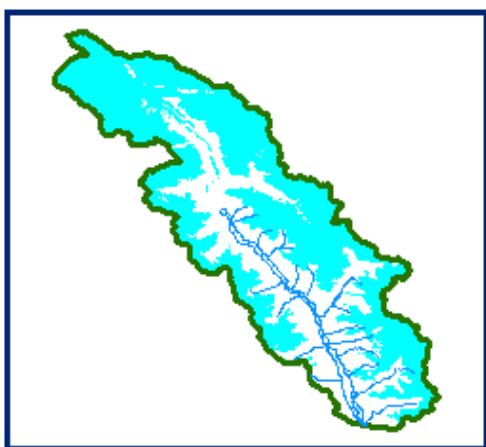
## **10 DAILY SNOW COVER MAP: NUBRA BASIN**



**DATA USED**  
**03 JUNE 2014**  
**10 JUNE 2014**  
**05 JUNE 2014**



**DATA USED**  
**11 JUNE 2014**



**DATA USED**  
**25 JUNE 2014**  
**27 JUNE 2014**  
**30 JUNE 2014**



0 15 30 60 90 120  
Kilometers

A scale bar at the bottom of the map frame, indicating distances in kilometers. The scale is marked at 0, 15, 30, 60, 90, and 120. Below the numbers is the text 'Kilometers'.

## AREAL EXTENT OF SNOW (5 DAILY)

**BASIN NAME: SHYOK**

**BASIN AREA: 27120 sq km**

S No	Date	Snow cover (sq. km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>							
1	04-Oct-13	6513	24	8	20-Oct-13	14293	53
2	06-Oct-13	6513	24	9	21-Oct-13	10074	37
3	08-Oct-13	5783	21	10	23-Oct-13	8306	31
4	09-Oct-13	5217	19	11	25-Oct-13	9844	36
5	11-Oct-13	5583	21	12	26-Oct-13	11627	43
6	16-Oct-13	11404	42	13	28-Oct-13	7329	27
7	18-Oct-13	8891	31				
<b>November 2013</b>							
14	02-Nov-13	7676	28	17	21-Nov-13	12257	45
15	13-Nov-13	12115	45	18	26-Nov-13	10895	40
16	16-Nov-13	13903	51	19	30-Nov-13	12861	47
<b>December 2013</b>							
20	01-Dec-13	10170	37	24	15-Dec-13	11280	42
21	10-Dec-13	12371	46	25	18-Dec-13	15744	58
22	12-Dec-13	16447	61	26	20-Dec-13	11042	41
23	13-Dec-13	15696	58	27	27-Dec-13	13711	51
<b>January 2014</b>							
28	03-Jan-14	11546	43	31	27-Jan-14	16569	61
29	18-Jan-14	16727	62	32	29-Jan-14	18843	69
30	24-Jan-14	16595	61	33	30-Jan-14	20961	77
<b>February 2014</b>							
34	08-Feb-14	15068	56	36	17-Feb-14	16335	60
35	15-Feb-14	13876	51	37	23-Feb-14	17793	66
<b>March 2014</b>							
38	06-Mar-14	13841	51	41	21-Mar-14	17903	66
39	13-Mar-14	19029	70	42	23-Mar-14	18473	68
40	19-Mar-14	19504	72	43	31-Mar-14	15623	58
<b>April 2014</b>							
44	09-Apr-14	17807	66	48	24-Apr-14	14504	53
45	11-Apr-14	18331	68	49	28-Apr-14	17994	66
46	12-Apr-14	21067	78	50	30-Apr-14	17241	64
47	14-Apr-14	14796	55				

<b>May 2014</b>							
51	03-May-14	13893	51	54	10-May-14	15324	57
52	06-May-14	14178	52	55	27-May-14	12366	46
53	08-May-14	12252	45				
<b>June 2014</b>							
56	03-Jun-14	11612	43	59	25-Jun-14	9281	34
57	06-Jun-14	11271	42	60	27-Jun-14	7424	27
58	08-Jun-14	8815	33	61	30-Jun-14	8465	31

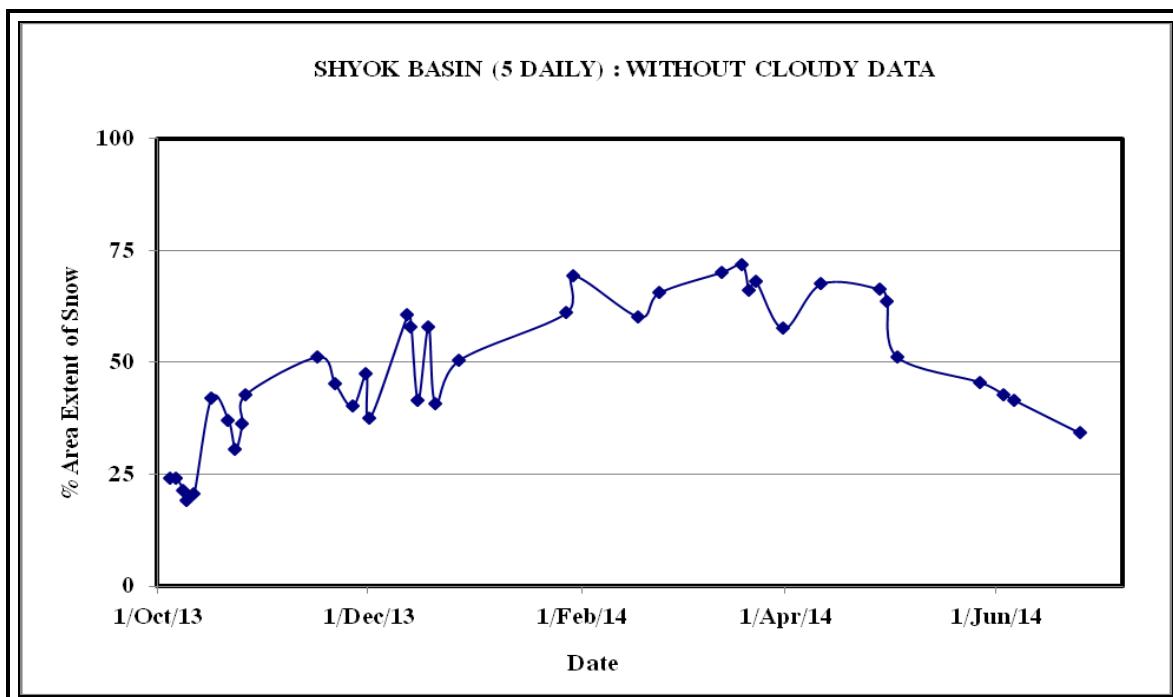
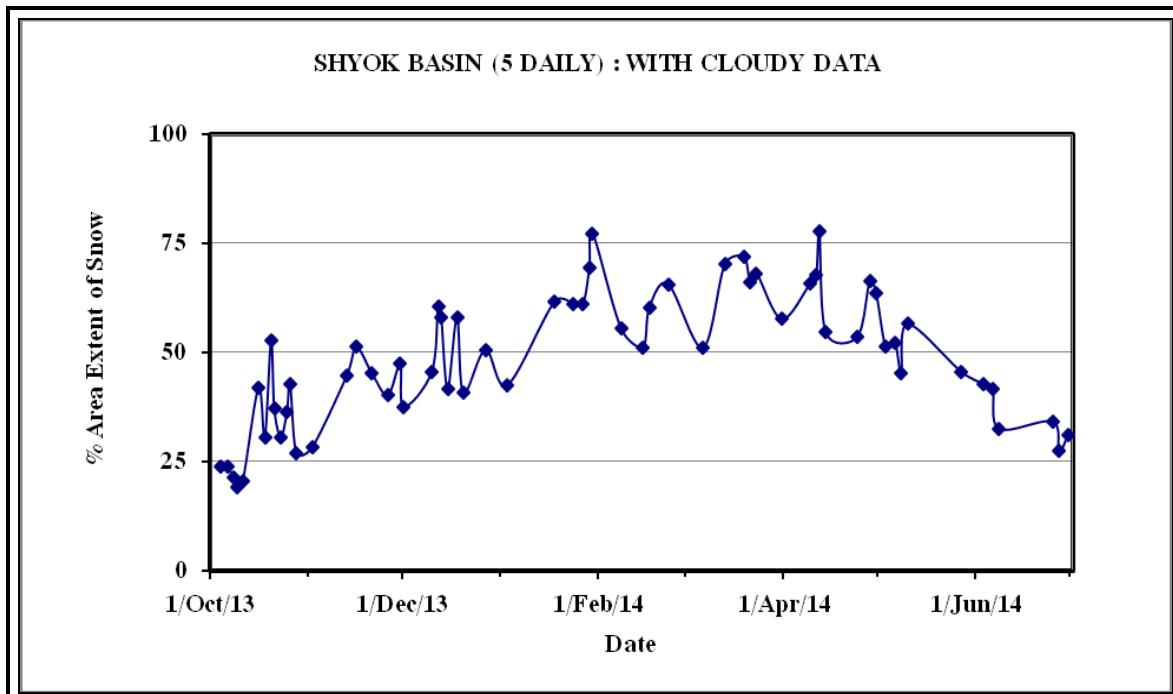
**AREAL EXTENT OF SNOW (10 DAILY)**

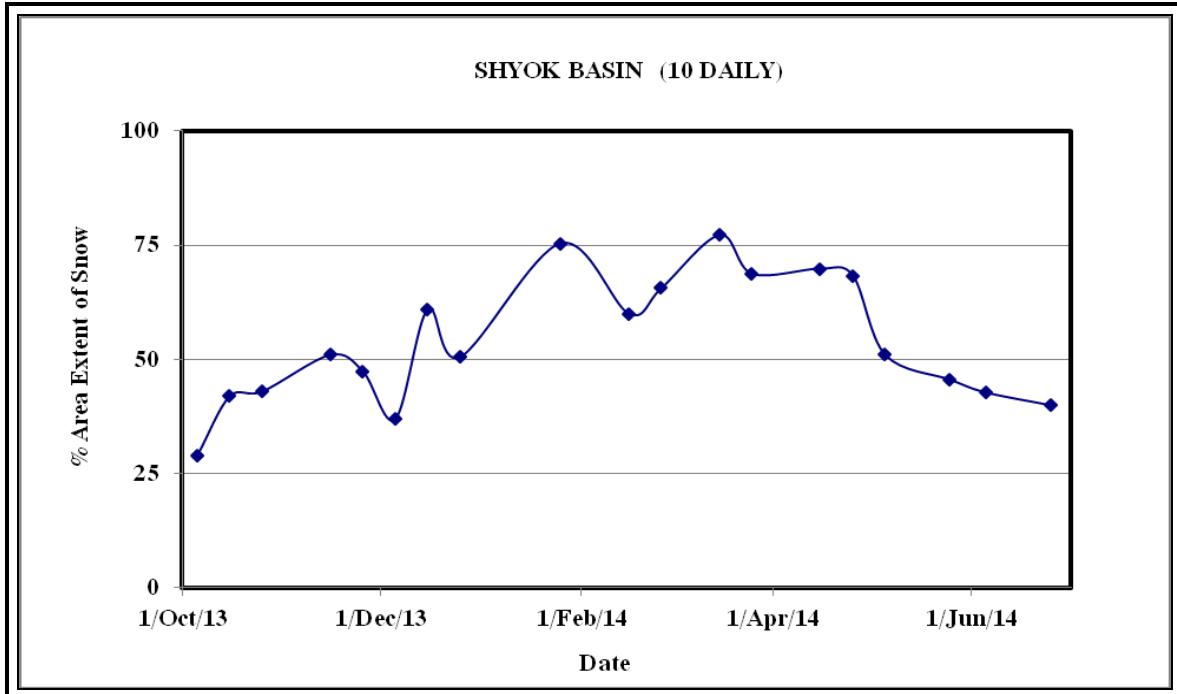
**BASIN NAME: SHYOK**

**BASIN AREA: 27120 sq. km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>				<b>November 2013</b>			
1	5-Oct-13	7867	29	4	15-Nov-13	13903	51
2	15-Oct-13	11404	42	5	25-Nov-13	12864	47
3	25-Oct-13	11627	43	6			
<b>December 2013</b>				<b>January 2014</b>			
7	5-Dec-13	10170	37	10	25-Jan-14	20449	75
8	15-Dec-13	16447	61				
9	25-Dec-13	13711	51				
<b>February 2014</b>				<b>March 2014</b>			
11	15-Feb-14	16335	60	13	15-Mar-14	20942	77
12	25-Feb-14	17793	66	14	25-Mar-14	18637	69
<b>April 2014</b>				<b>May 2014</b>			
15	15-Apr-14	18950	70	17	5-May-14	13893	51
16	25-Apr-14	18538	68	18	25-May-14	12366	46
<b>June 2014</b>							
19	5-Jun-014	11612	43				
20	25-Jun-14	10854	40				

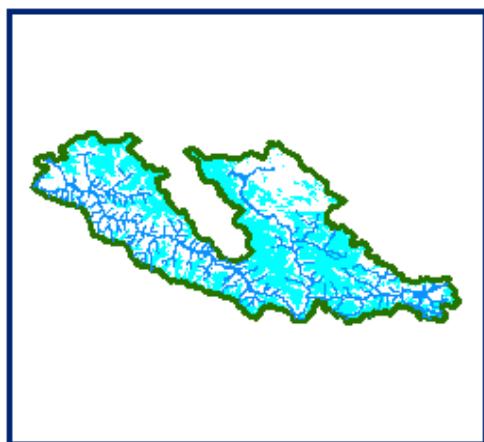
## Snow cover depletion curve



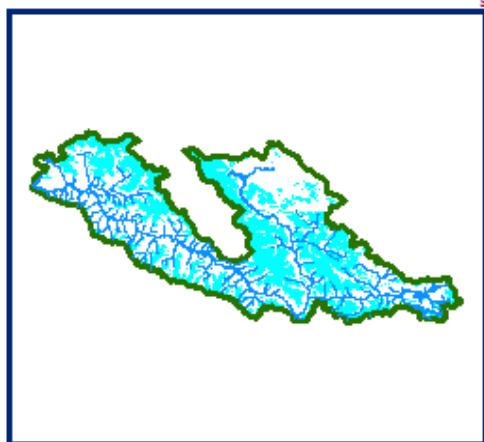


# *SNOW COVER MAP*

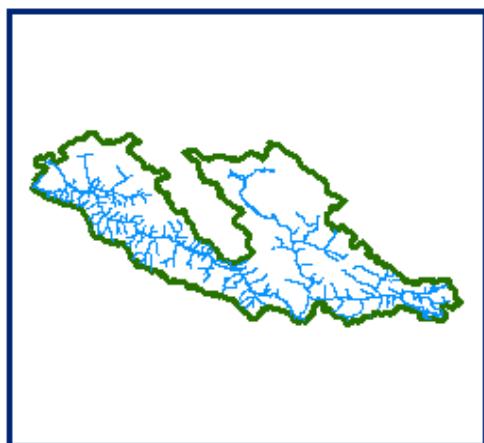
**SNOW COVER MAP : SHYOK BASIN**



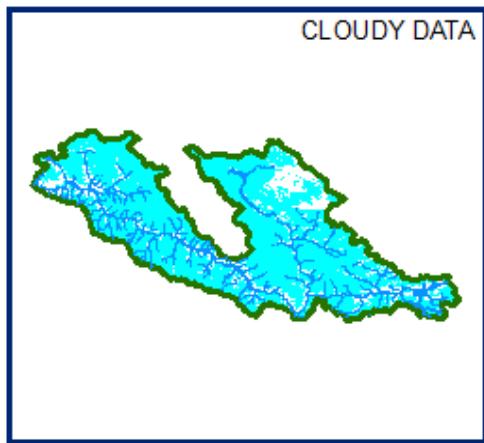
**04 OCTOBER 2013**



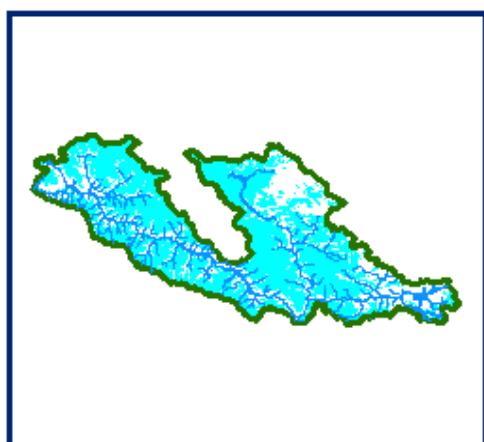
**09 OCTOBER 2013**



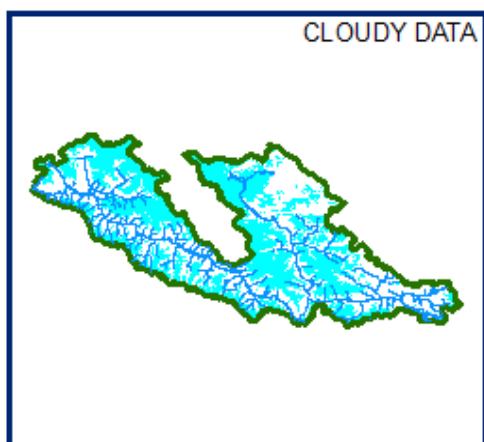
**DATA NOT AVAILABLE**



**20 OCTOBER 2013**



**25 OCTOBER 2013**

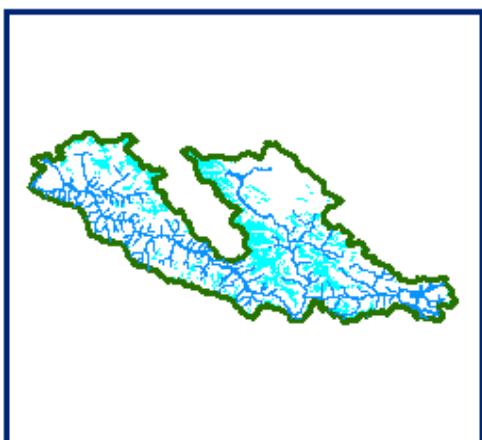


**28 OCTOBER 2013**

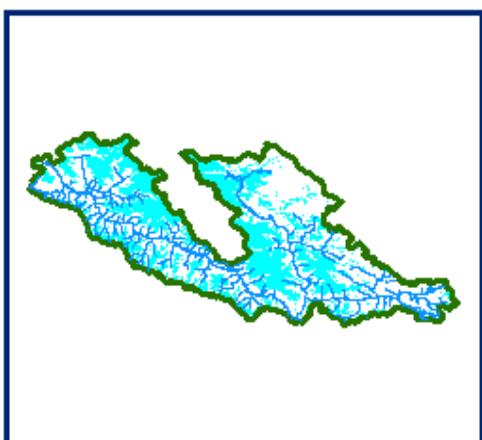
**SNOW**

0 50 100 200 300 400  
Kilometers

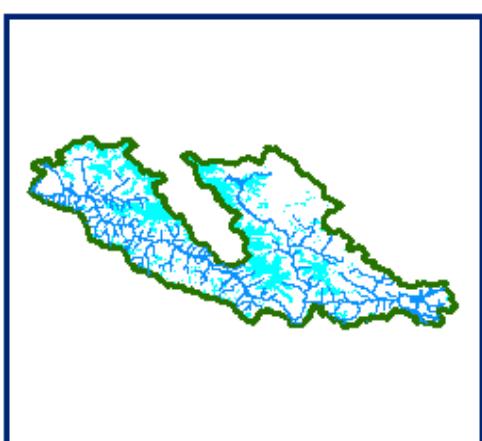
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



**DATA USED**  
**04 OCTOBER 2013**  
**06 OCTOBER 2013**  
**09 OCTOBER 2013**



**DATA USED**  
**18 OCTOBER 2013**  
**20 OCTOBER 2013**



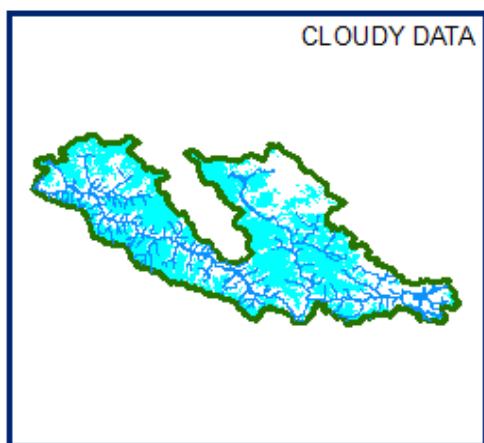
**DATA USED**  
**23 OCTOBER 2013**  
**28 OCTOBER 2013**  
**25 OCTOBER 2013**



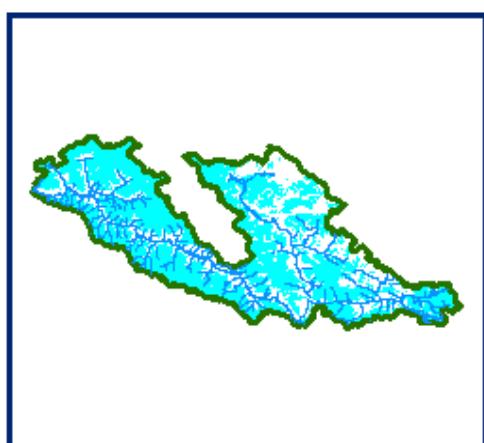
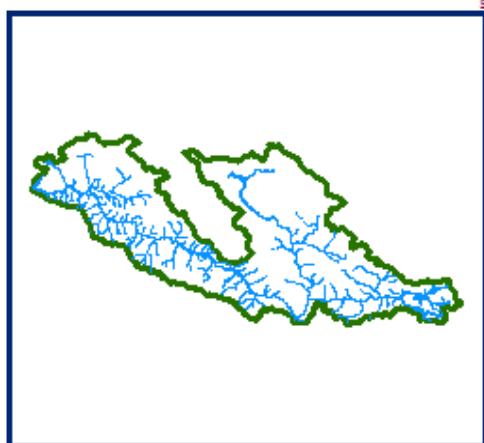
**SNOW**

0 50 100 200 300 400  
Kilometers

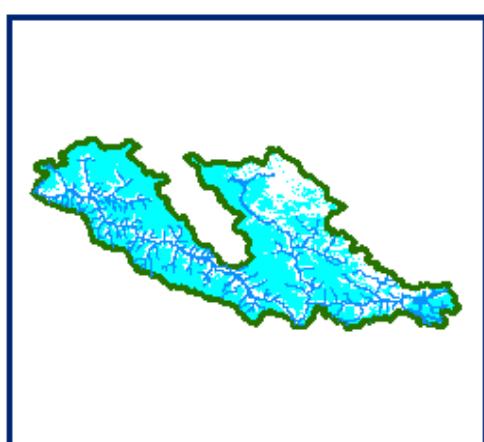
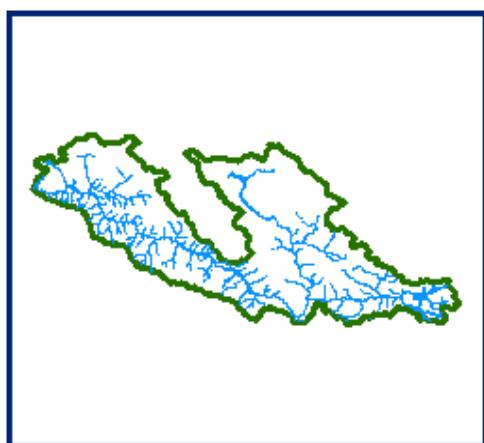
**SNOW COVER MAP : SHYOK BASIN**



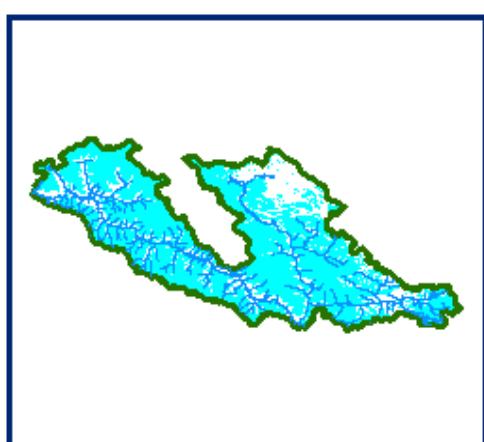
02 NOVEMBER 2013  
28 OCTOBER 2013



13 NOVEMBER 2013



21 NOVEMBER 2013

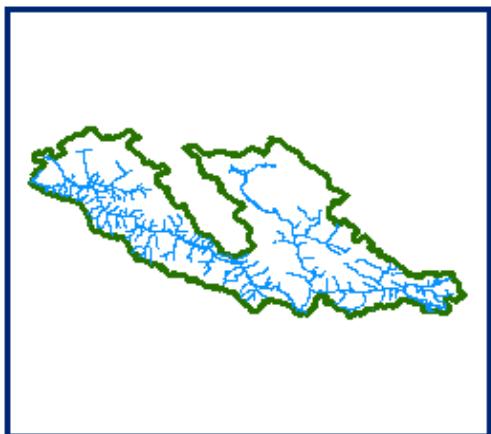


30 NOVEMBER 2013

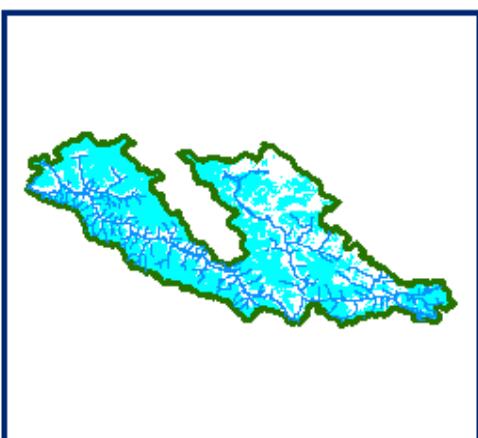
SNOW

0 50 100 200 300 400  
Kilometers

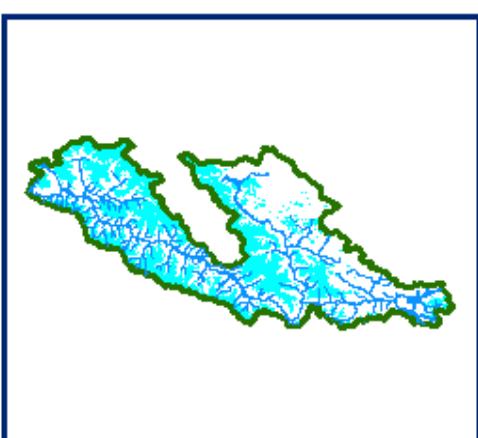
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



**DATA USED  
DATA NOT AVAILABLE**



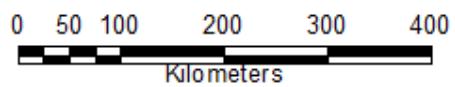
**DATA USED  
13 NOVEMBER 2013**



**DATA USED  
21 NOVEMBER 2013  
26 NOVEMBER 2013  
30 NOVEMBER 2013**

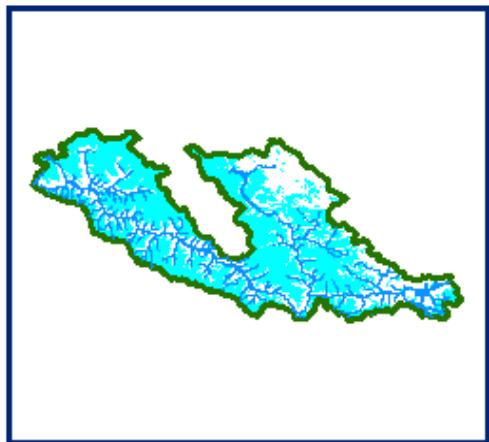


**SNOW**

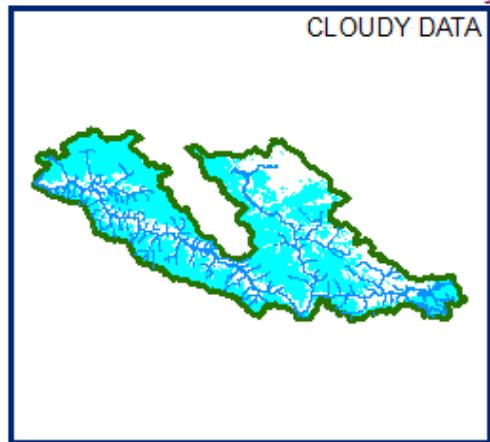


## SNOW COVER MAP

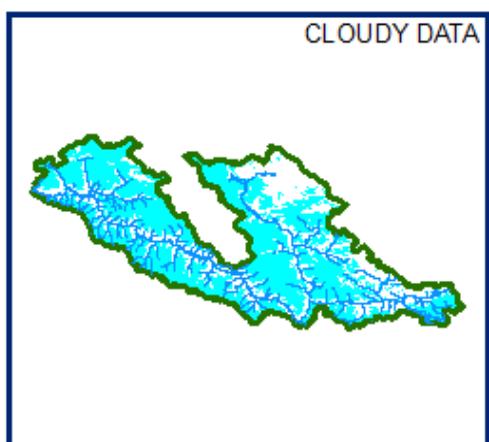
: SHYOK BASIN



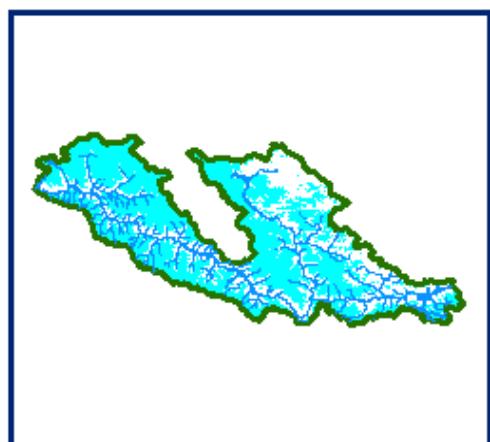
01 DECEMBER 2013  
20 DECEMBER 2013



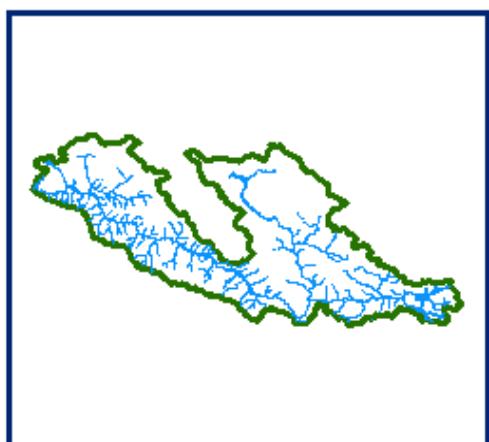
10 DECEMBER 2013



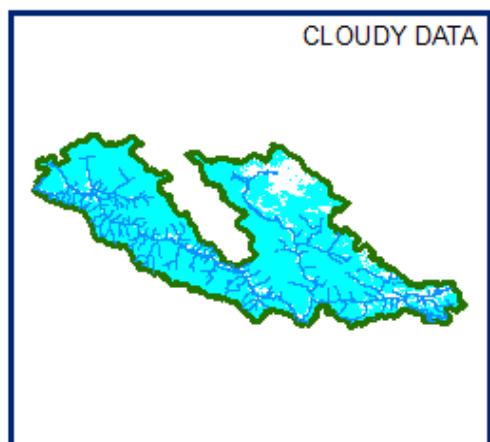
15 DECEMBER 2013



20 DECEMBER 2013



DATA NOT AVAILABLE



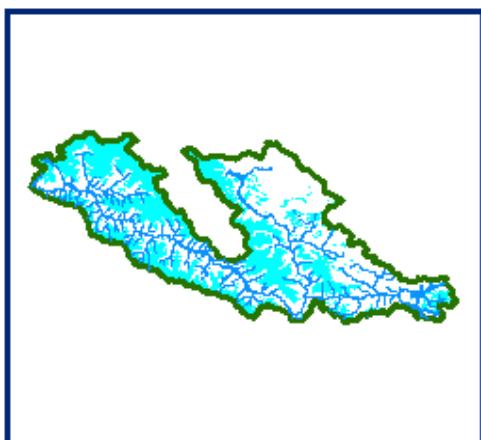
27 DECEMBER 2013



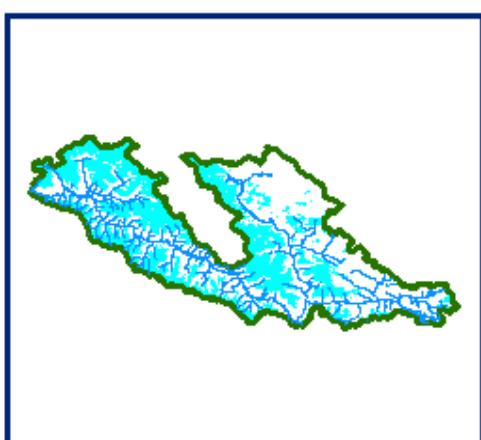
SNOW

0 50 100 200 300 400  
Kilometers

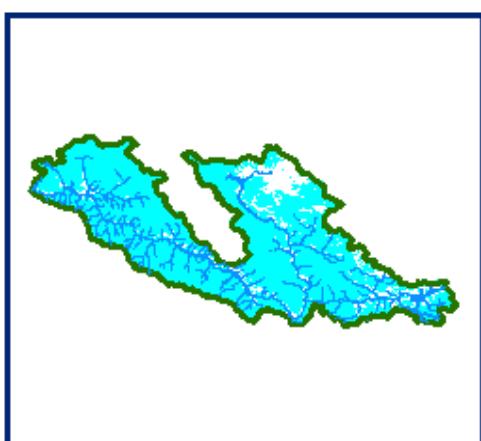
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



**DATA USED  
01 DECEMBER 2013  
10 DECEMBER 2013**



**DATA USED  
20 DECEMBER 2013  
15 DECEMBER 2013  
12 DECEMBER 2013**



**DATA USED  
27 DECEMBER 2013**



**SNOW**

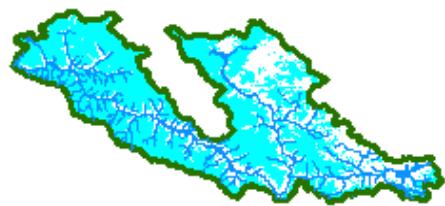
0 50 100 200 300 400  
Kilometers

## SNOW COVER MAP

: SHYOK BASIN



CLOUDY DATA



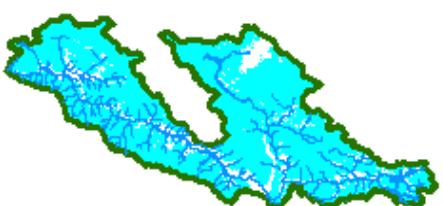
03 JANUARY 2014

DATA NOT AVAILABLE



DATA NOT AVAILABLE

CLOUDY DATA



18 JANUARY 2014

CLOUDY DATA



24 JANUARY 2014

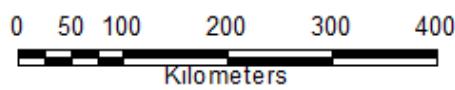
CLOUDY DATA



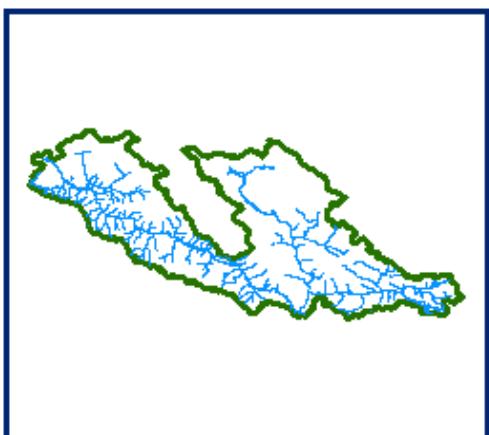
27 JANUARY 2014



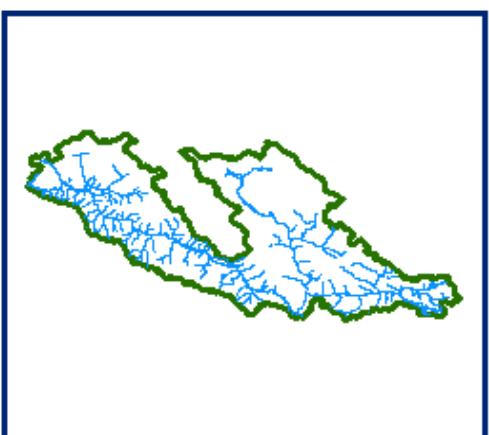
SNOW



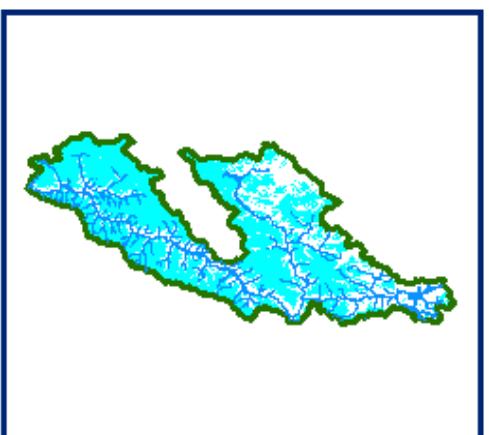
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
29 JANUARY 2014  
27 JANUARY 2014  
24 JANUARY 2014**

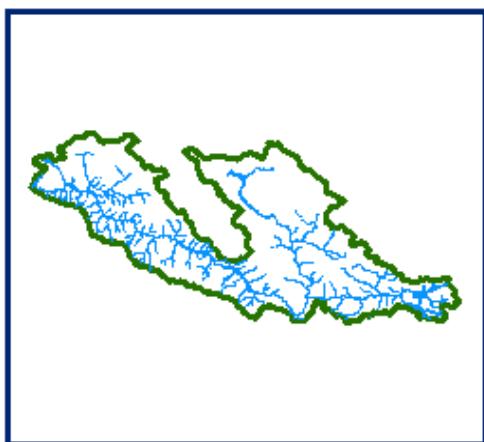


**SNOW**

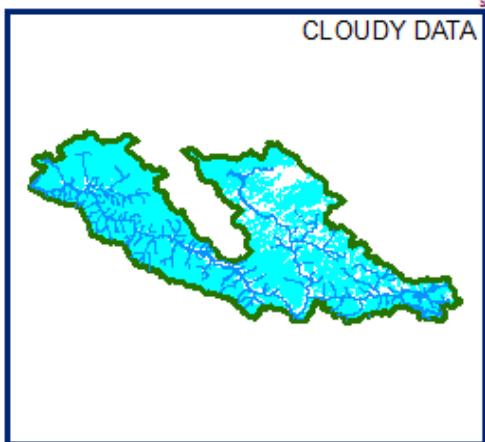
0 50 100 200 300 400  
Kilometers

A scale bar at the bottom of the map frame, indicating distances from 0 to 400 kilometers. The word 'Kilometers' is written below the scale bar.

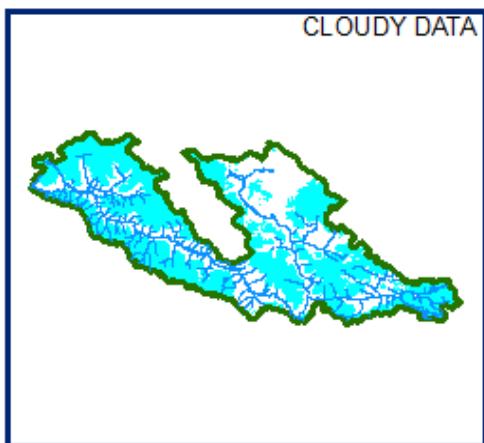
**SNOW COVER MAP : SHYOK BASIN**



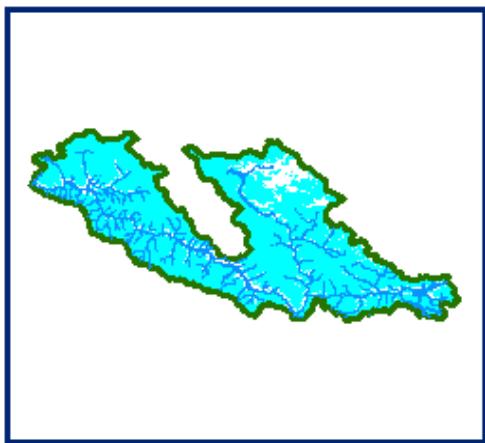
**DATA NOT AVAILABLE**



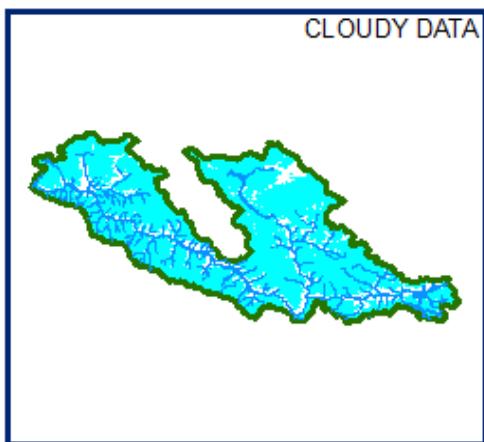
**08 FEBRUARY 2014**



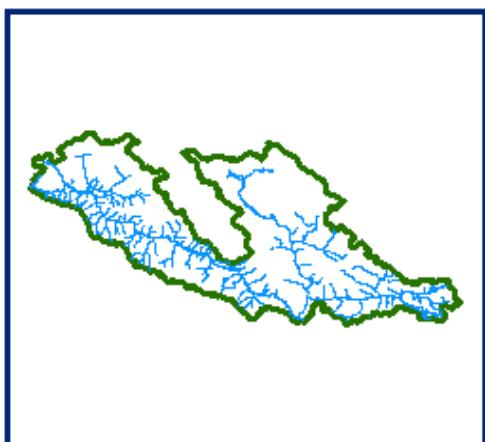
**15 FEBRUARY 2014**



**17 FEBRUARY 2014**



**23 FEBRUARY 2014**

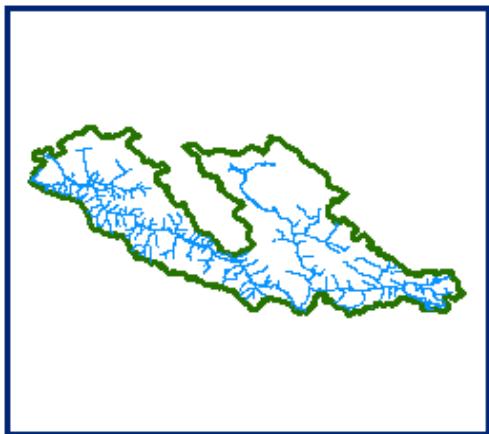


**DATA NOT AVAILABLE**

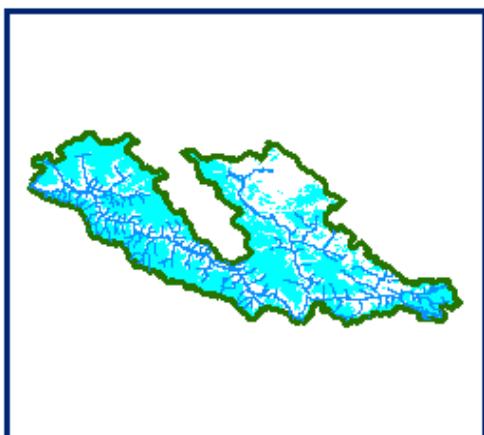


0 50 100 200 300 400  
Kilometers

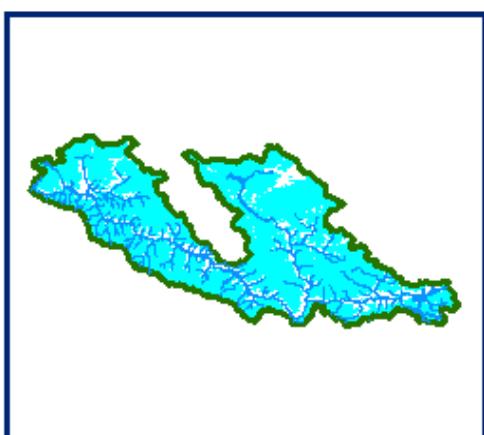
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
17 FEBRUARY 2014  
15 FEBRUARY 2014**

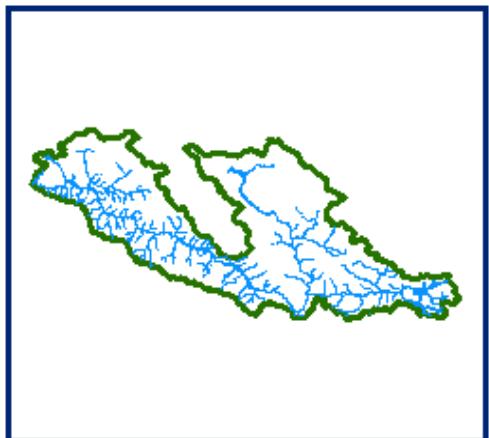


**DATA USED  
23 FEBRUARY 2014**

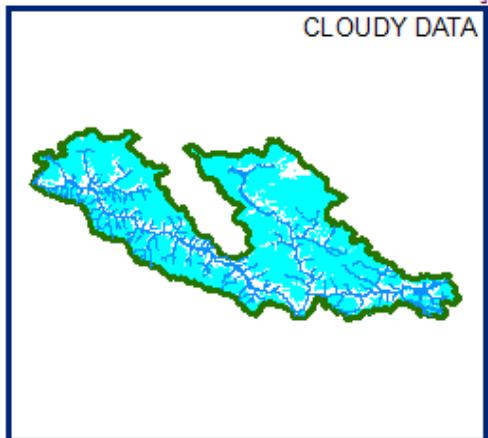


0 50 100 200 300 400  
A horizontal scale bar at the bottom of the map frame, ranging from 0 to 400 Kilometers. It includes numerical markings at 0, 50, 100, 200, 300, and 400, and a dashed line between 100 and 200.

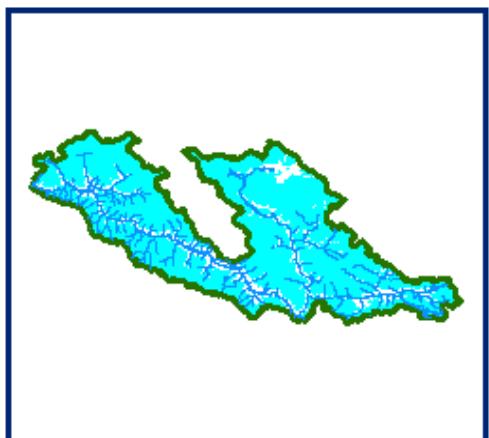
**SNOW COVER MAP : SHYOK BASIN**



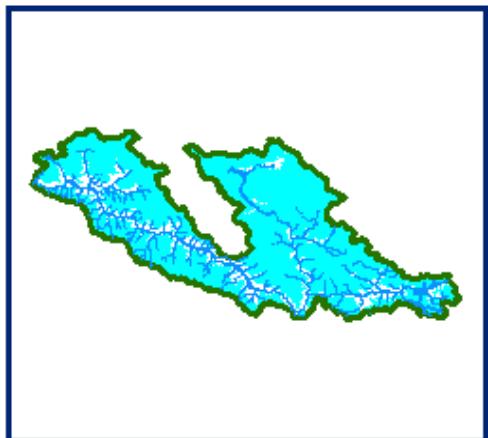
**DATA NOT AVAILABLE**



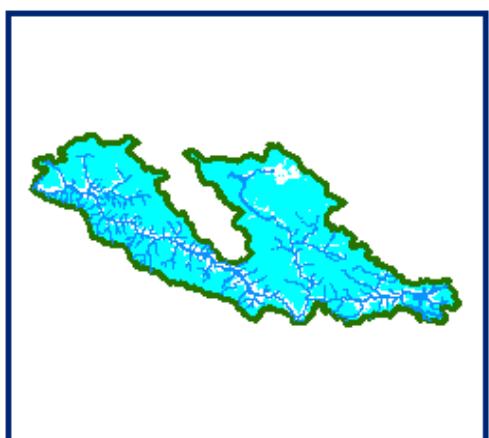
**06 MARCH 2014**



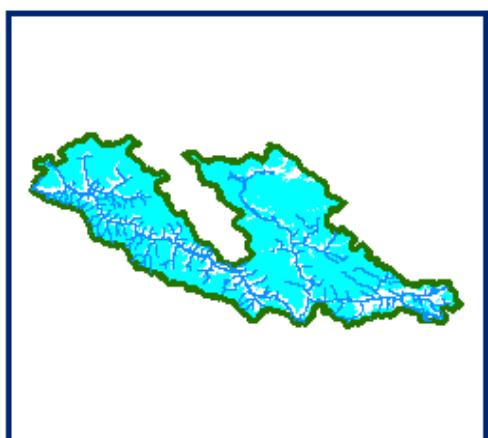
**13 MARCH 2014**



**19 MARCH 2014**



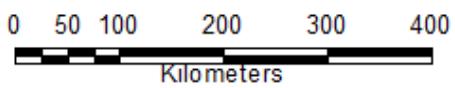
**23 MARCH 2014**



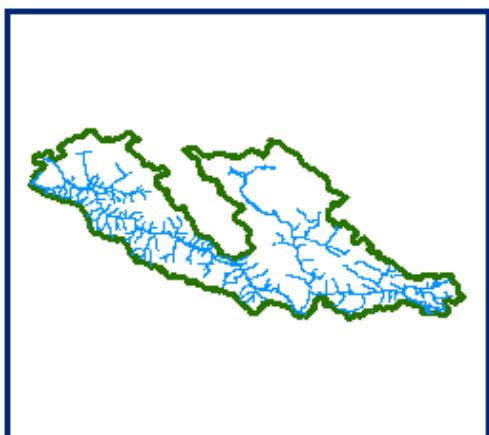
**31 MARCH 2014**



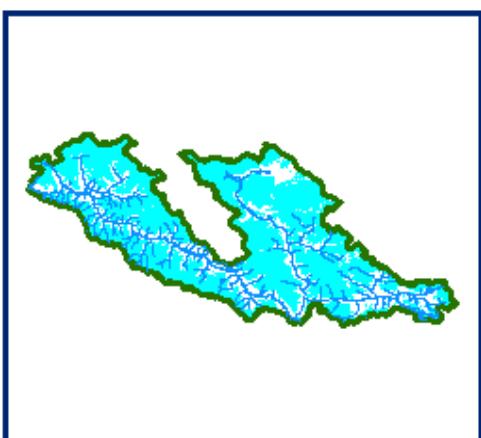
**SNOW**



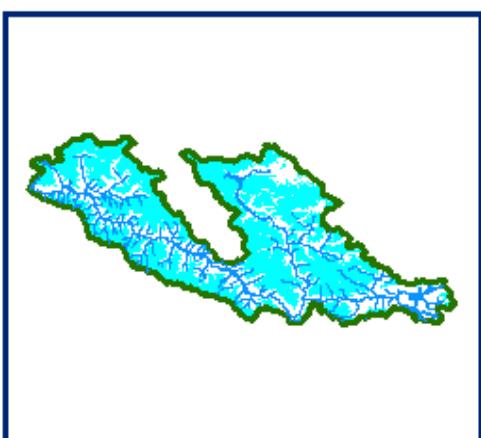
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



**DATA USED  
DATA NOT AVAILABLE**



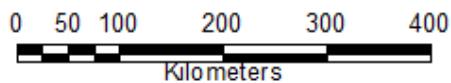
**DATA USED  
13 MARCH 2014  
19 MARCH 2014**



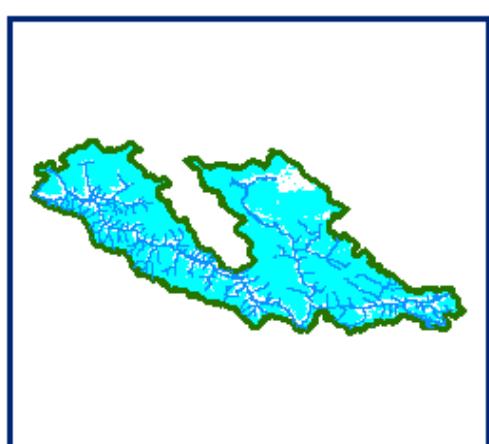
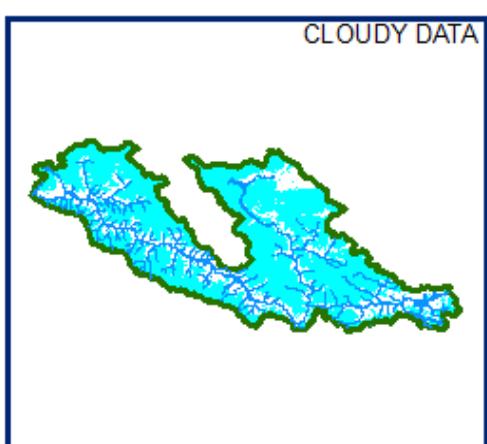
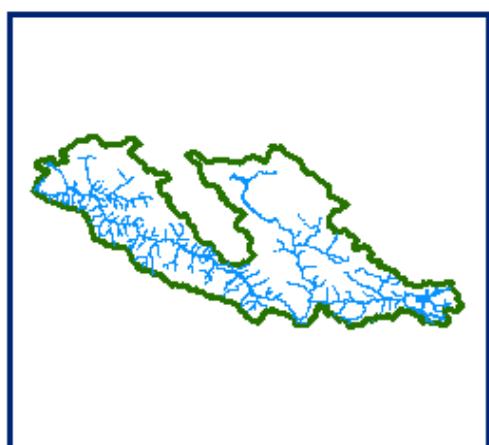
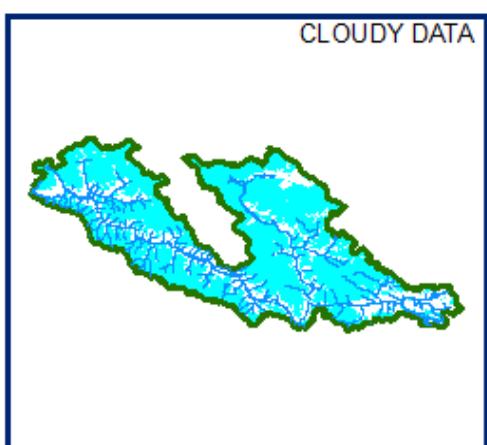
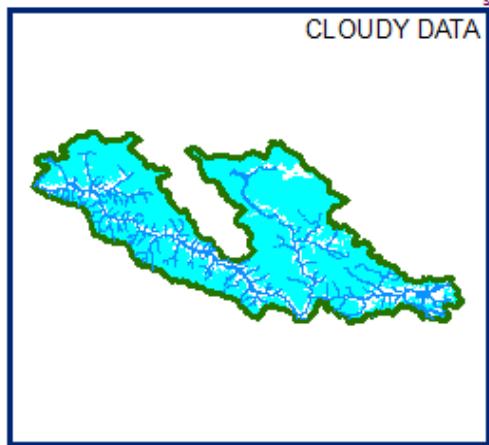
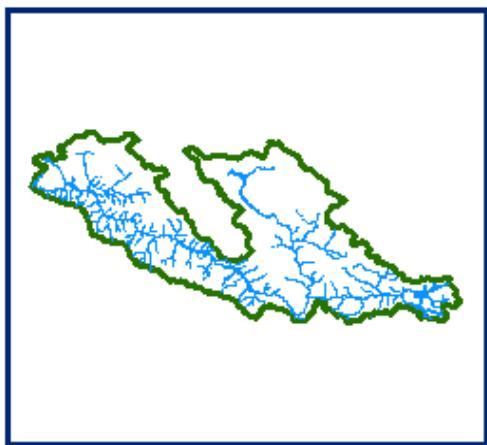
**DATA USED  
31 MARCH 2014  
21 MARCH 2014  
23 MARCH 2014**



**SNOW**



**SNOW COVER MAP : SHYOK BASIN**

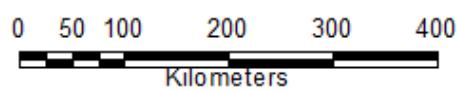


**24 APRIL 2014**

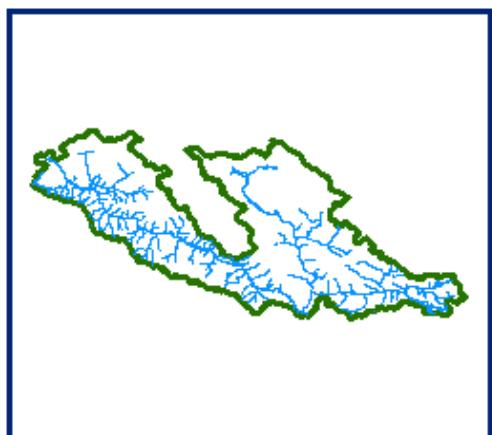
**30 APRIL 2014**



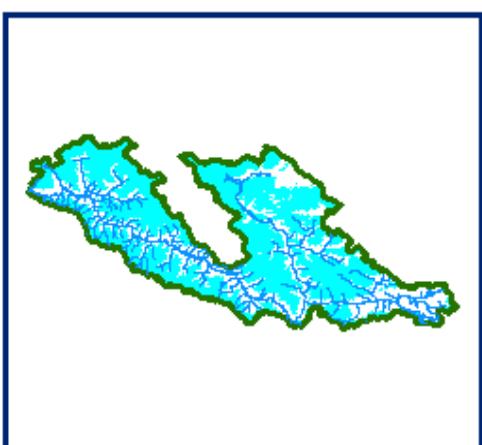
**SNOW**



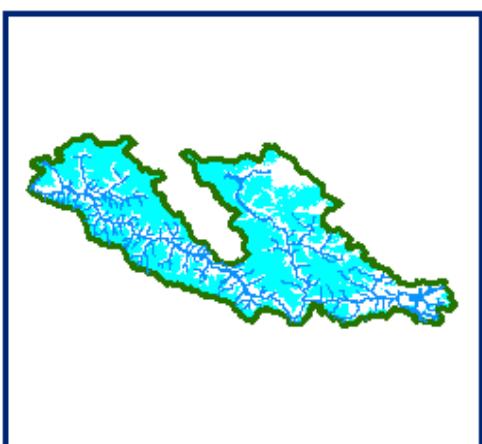
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



**DATA USED  
DATA NOT AVAILABLE**



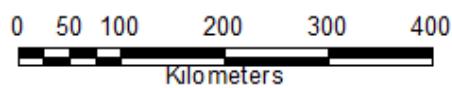
**DATA USED  
11 APRIL 2014  
14 APRIL 2014  
12 APRIL 2014**



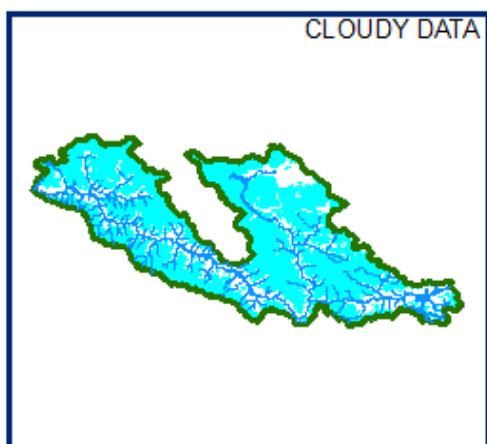
**DATA USED  
28 APRIL 2014  
24 APRIL 2014  
30 APRIL 2014**



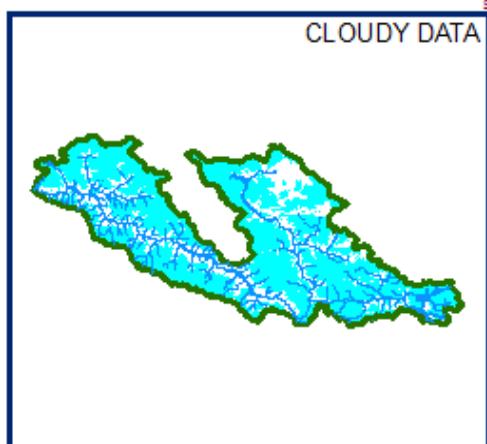
**SNOW**



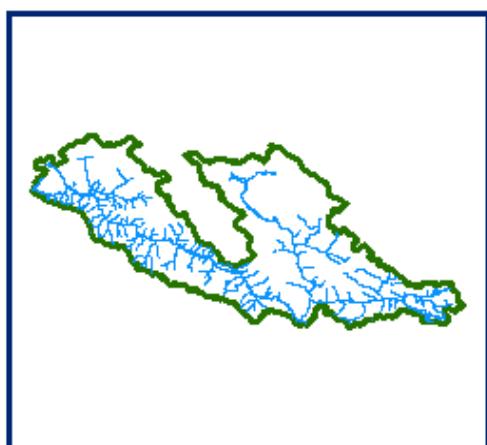
**SNOW COVER MAP : SHYOK BASIN**



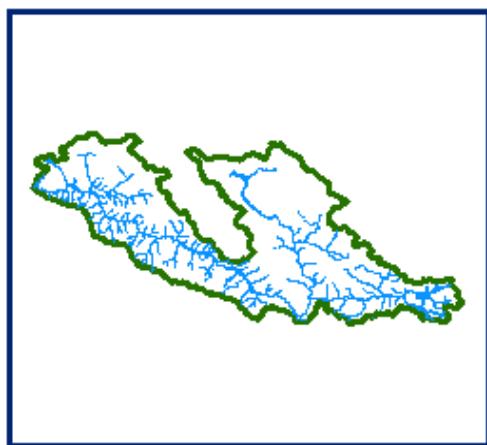
03 MAY 2014



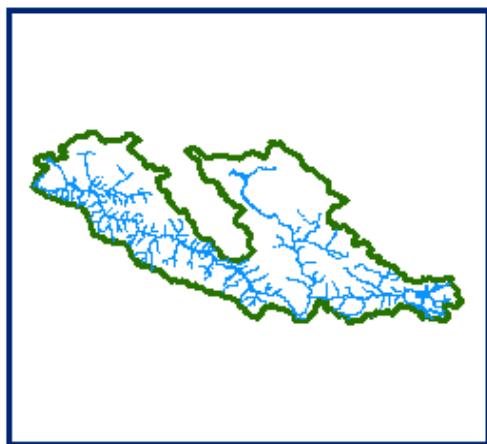
10 MAY 2014



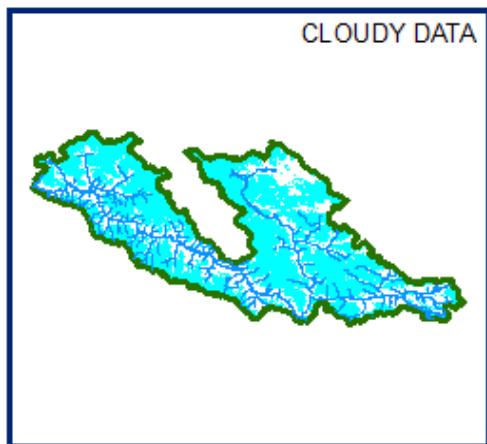
DATA NOT AVAILABLE



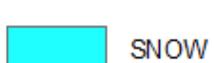
DATA NOT AVAILABLE



DATA NOT AVAILABLE

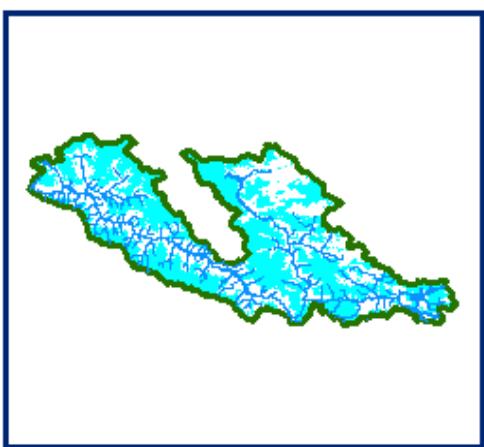


27 MAY 2014

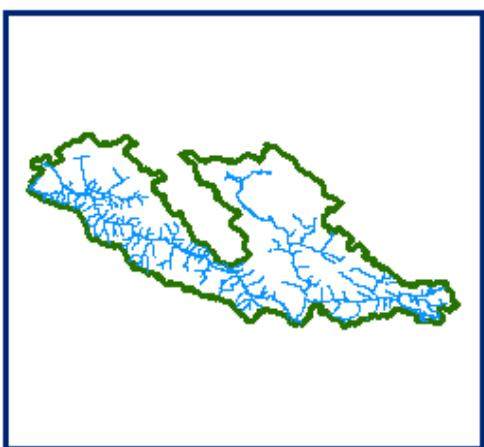


0 50 100 200 300 400  
Kilometers

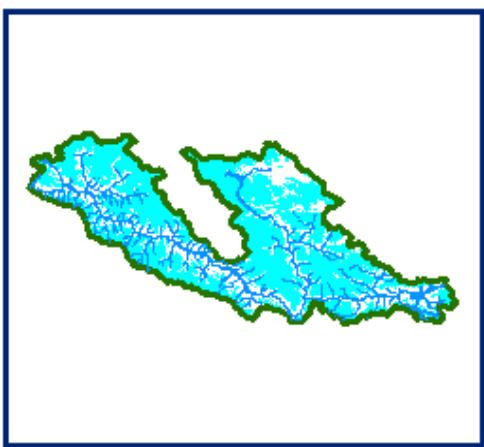
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



DATA USED  
**10 MAY 2014**  
**08 MAY 2014**  
**03 MAY 2014**



DATA USED  
**DATA NOT AVAILABLE**



DATA USED  
**27 MAY 2014**

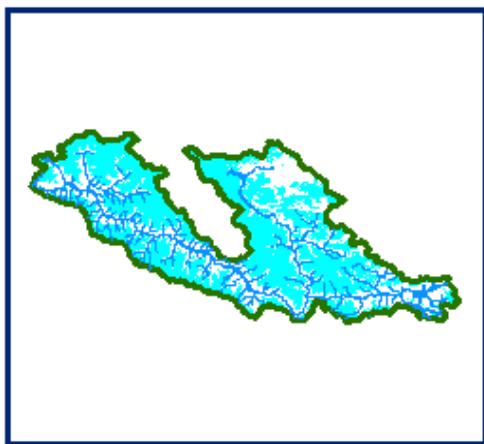


SNOW

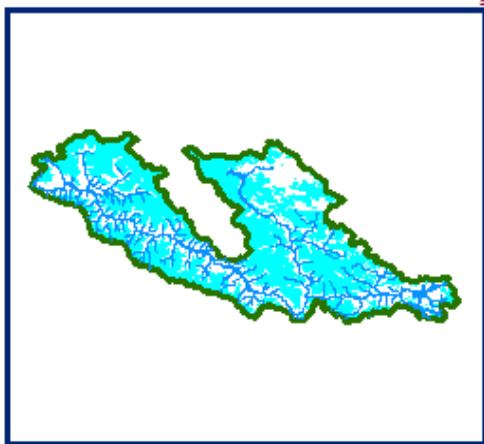
0 50 100 200 300 400  
Kilometers

A scale bar at the bottom of the map frame, showing distances from 0 to 400 kilometers. The scale is marked in increments of 50 km. Below the numerical values is the word 'Kilometers'.

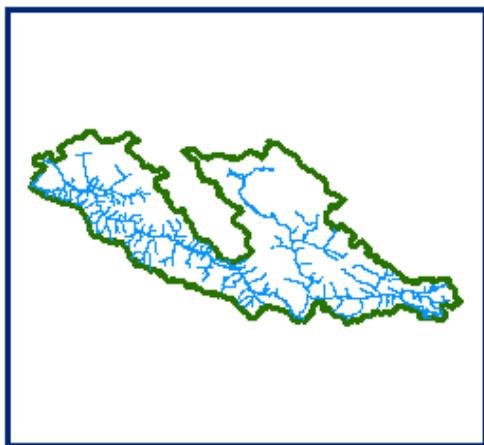
**SNOW COVER MAP : SHYOK BASIN**



**03 JUNE 2014**



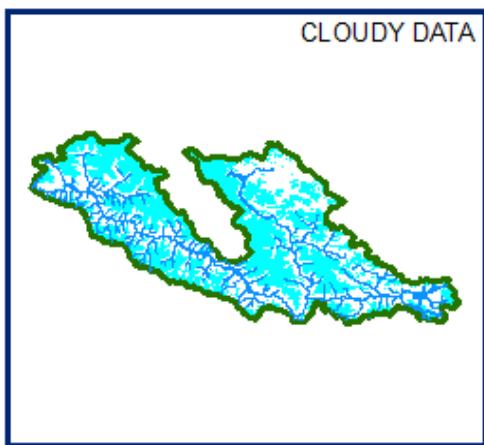
**06 JUNE 2014**



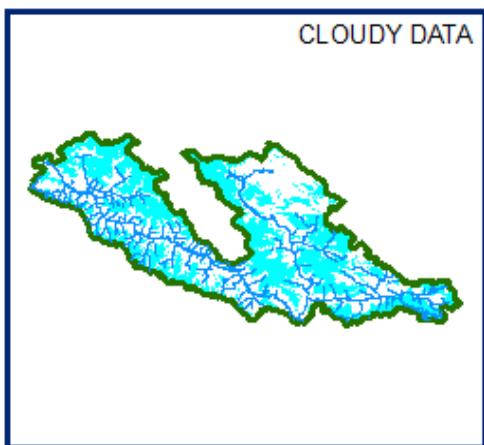
**DATA NOT AVAILABLE**



**DATA NOT AVAILABLE**



**25 JUNE 2014**

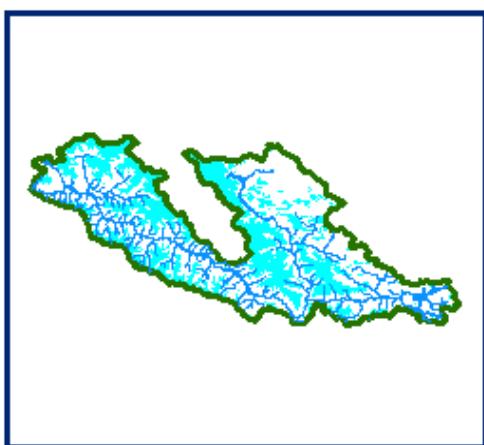


**30 JUNE 2014**

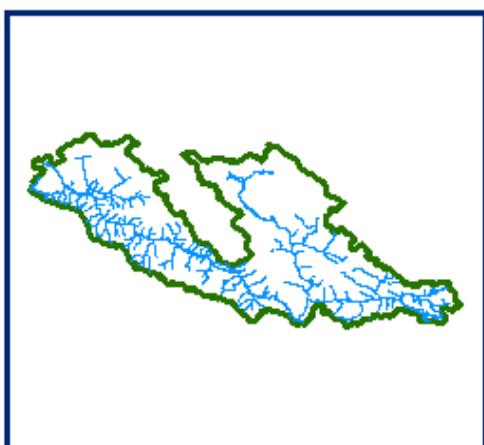
**SNOW**

0 50 100 200 300 400  
Kilometers

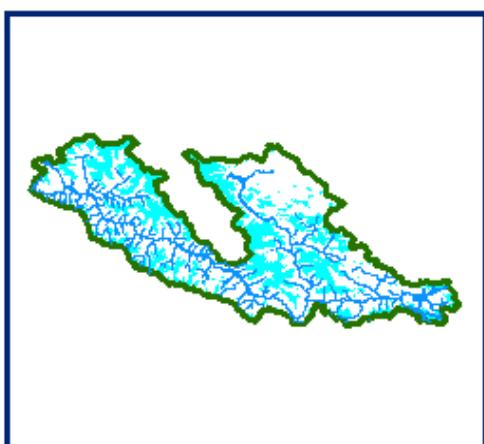
**10 DAILY SNOW COVER MAP: SHYOK BASIN**



DATA USED  
06 JUNE 2014  
10 JUNE 2014  
03 JUNE 2014



DATA USED  
DATA NOT AVAILABLE



DATA USED  
25 JUNE 2014  
30 JUNE 2014  
27 JUNE 2014



SNOW

0 50 100 200 300 400  
Kilometers

### AREAL EXTENT OF SNOW (5 DAILY)

**BASIN NAME: SHIGAR**

**BASIN AREA: 7050 sq. km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>							
1	03-Oct-13	2435	35	9	16-Oct-13	3170	45
2	04-Oct-13	2377	34	10	18-Oct-13	3281	47
3	06-Oct-13	2695	38	11	20-Oct-13	3596	51
4	08-Oct-13	2268	32	12	21-Oct-13	3704	53
5	09-Oct-13	2610	37	13	23-Oct-13	2875	41
6	10-Oct-13	3447	49	14	25-Oct-13	3168	45
7	11-Oct-13	1806	26	15	28-Oct-13	3164	45
8	15-Oct-13	2885	41				
<b>November 2013</b>							
16	01-Nov-13	4242	60	21	20-Nov-13	4858	69
17	02-Nov-13	3880	55	22	21-Nov-13	4572	65
18	13-Nov-13	4834	69	23	25-Nov-13	3080	44
19	15-Nov-13	4057	58	24	26-Nov-13	4114	58
20	16-Nov-13	5091	72	25	30-Nov-13	4351	62
<b>December 2013</b>							
26	10-Dec-13	4738	67	29	20-Dec-13	5728	81
27	12-Dec-13	5349	76	30	26-Dec-13	5635	80
28	15-Dec-13	4267	61	31	27-Dec-13	5562	79
<b>January 2014</b>							
32	02-Jan-14	4766	68	37	19-Jan-14	6231	88
33	03-Jan-14	3086	44	38	24-Jan-14	1087	15
34	07-Jan-14	5356	76	39	27-Jan-14	6292	89
35	15-Jan-14	6538	93	40	29-Jan-14	6250	88
36	17-Jan-14	5311	77	41	31-Jan-14	4690	67
<b>February 2014</b>							
42	08-Feb-14	5874	83	45	15-Feb-14	5411	77
43	10-Feb-14	5277	75	46	17-Feb-14	5953	84
44	12-Feb-14	5581	79				
<b>March 2014</b>							
47	06-Mar-14	5530	78	50	20-Mar-14	5877	83
48	08-Mar-14	5406	77	51	21-Mar-14	6006	85
49	13-Mar-14	6003	85	52	23-Mar-14	5704	81
<b>April 2014</b>							
53	09-Apr-14	5664	80	56	14-Apr-14	4593	65

54	11-Apr-14	6708	95	57	28-Apr-14	5561	79
55	13-Apr-14	5650	80	58	30-Apr-14	4724	67
<b>May 2014</b>							
59	03-May-14	4331	61	63	24-May-14	4607	65
60	07-May-14	4382	62	64	27-May-14	4201	60
61	08-May-14	3635	52	65	29-May-14	4453	63
62	10-May-14	5064	72				
<b>June 2014</b>							
66	03-Jun-14	3833	54	70	12-Jun-14	4400	62
67	05-Jun-14	4804	68	71	25-Jun-14	3791	54
68	08-Jun-14	3151	45	72	27-Jun-14	3770	53
69	10-Jun-14	4607	65				

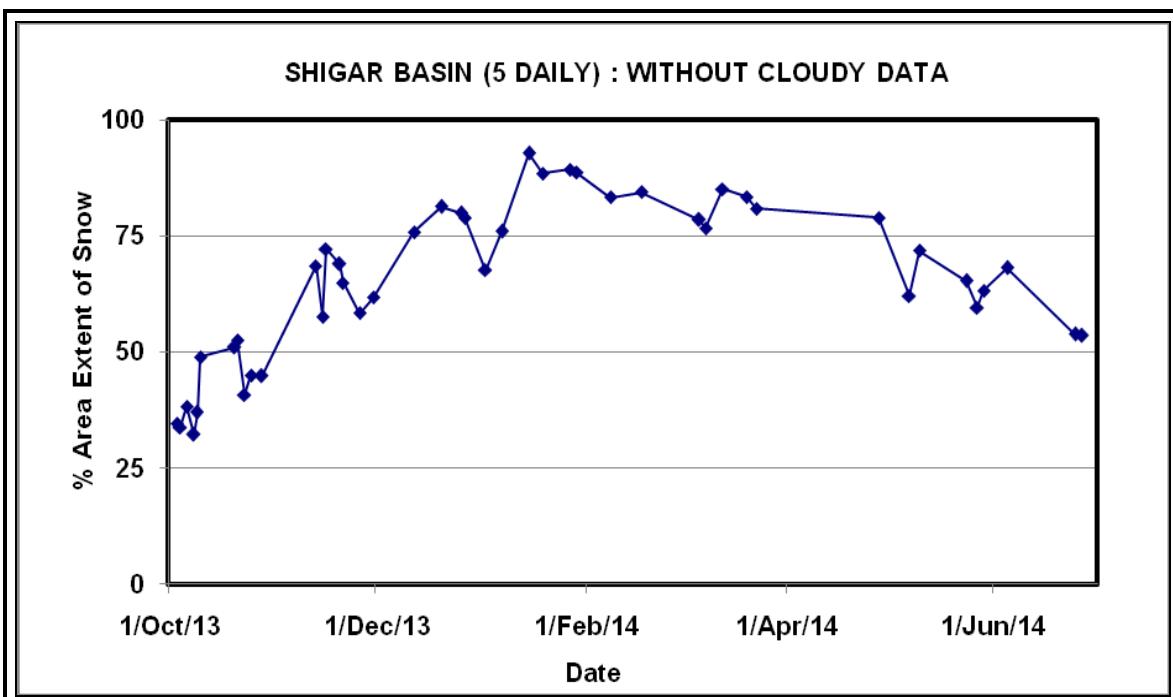
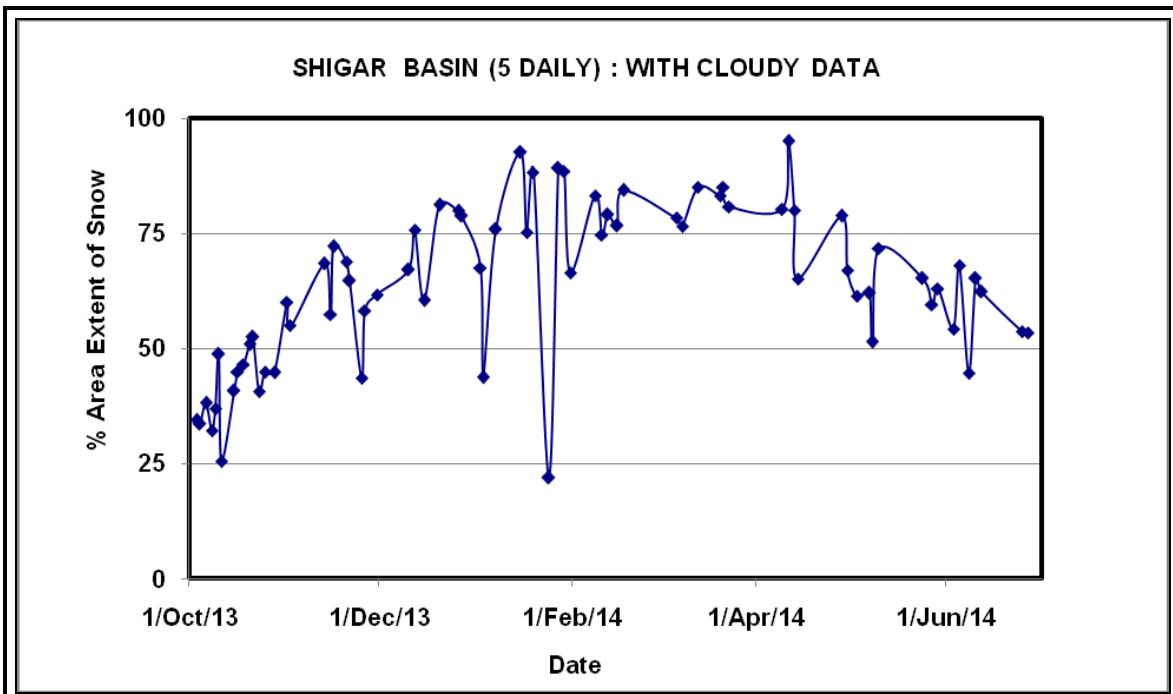
### AREAL EXTENT OF SNOW (10 DAILY)

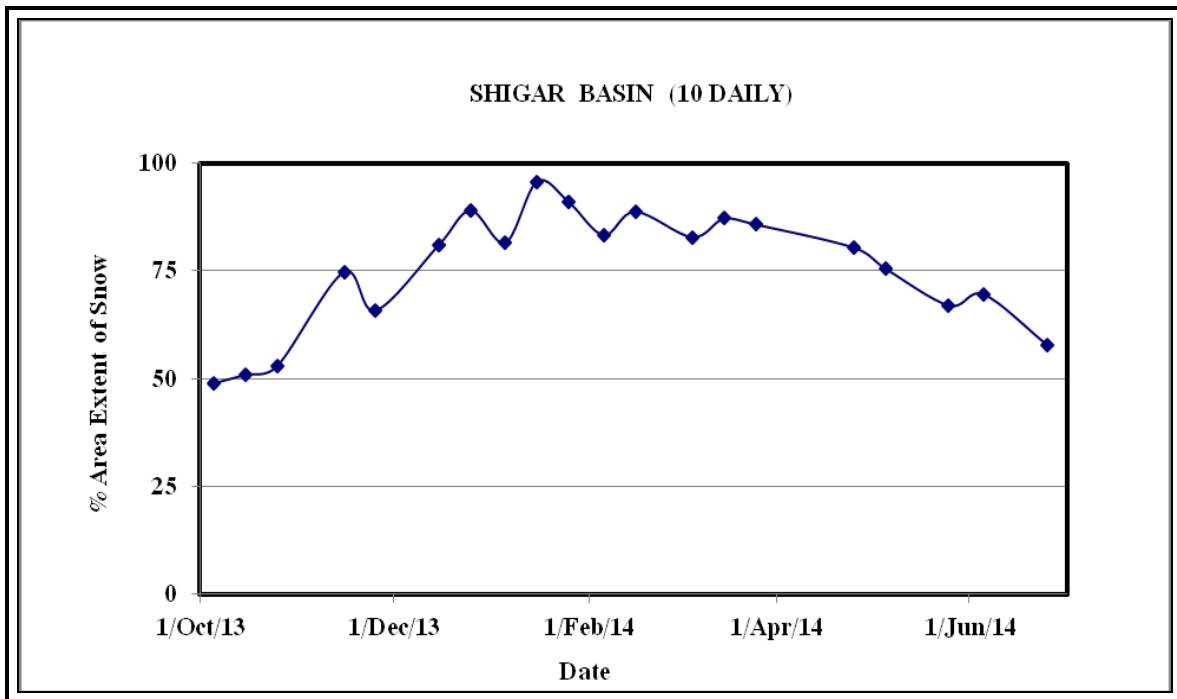
**BASIN NAME: SHIGAR**

**BASIN AREA: 7050 sq. km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>				<b>November 2013</b>			
1	5-Oct-13	3447	49	4	15-Nov-13	5269	75
2	15-Oct-13	3596	51	5	25-Nov-13	4643	66
3	25-Oct-04	3704	53				
<b>December 2013</b>				<b>January 2014</b>			
7	15-Dec-13	5728	81	9	5-Jan-14	5750	82
8	25-Dec-13	6274	89	10	15-Jan-14	6748	96
				11	25-Jan-14	6413	91
<b>February 2014</b>				<b>March 2014</b>			
12	5-Feb-14	5874	83	14	5-Mar-14	5839	83
13	15-Feb-14	6258	89	15	15-Mar-14	6145	87
				16	25-Mar-14	6046	86
<b>April 2014</b>				<b>May 2014</b>			
17	25-Apr-14	5667	80	18	5-May-14	5325	76
				19	25-May-14	4724	67
<b>June 2014</b>							
20	5-Jun-14	4904	70				
21	25-Jun-14	4082	58				

### Snow cover depletion curve

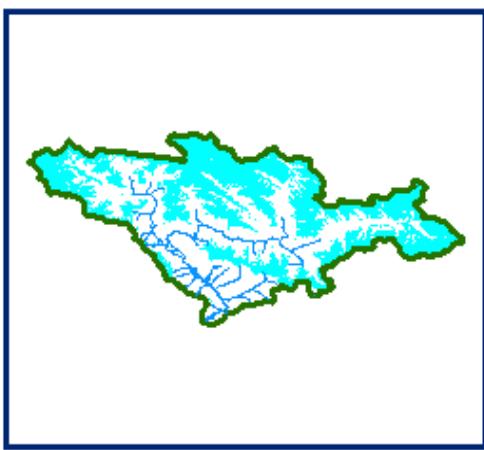




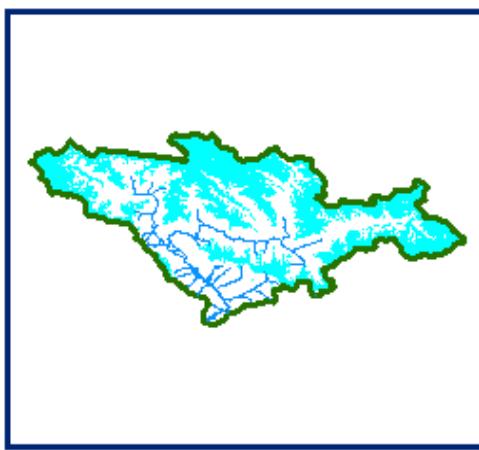
# *SNOW COVER MAP*

**SNOW COVER MAP**

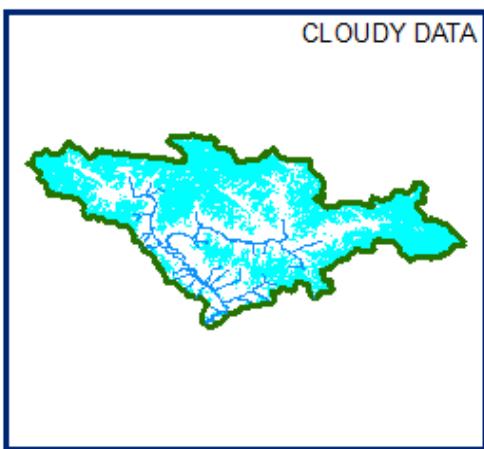
: SHIGAR BASIN



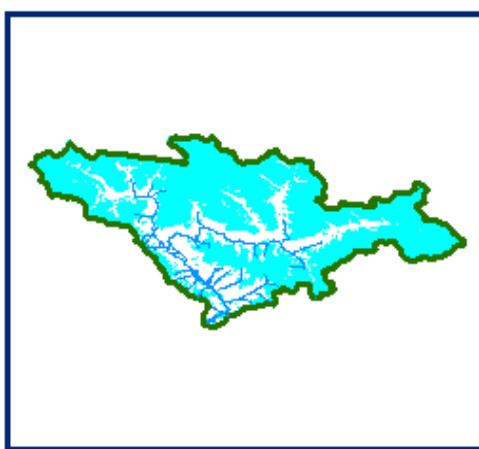
03 OCTOBER 2013



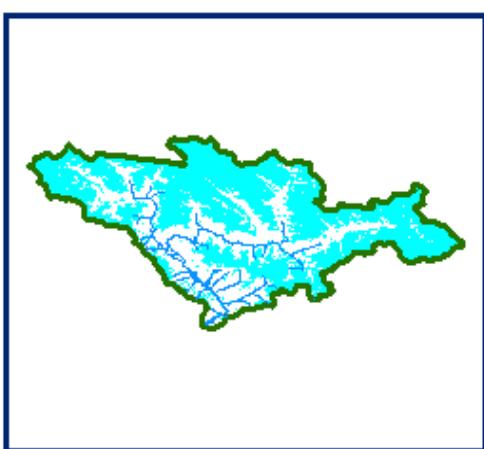
08 OCTOBER 2013



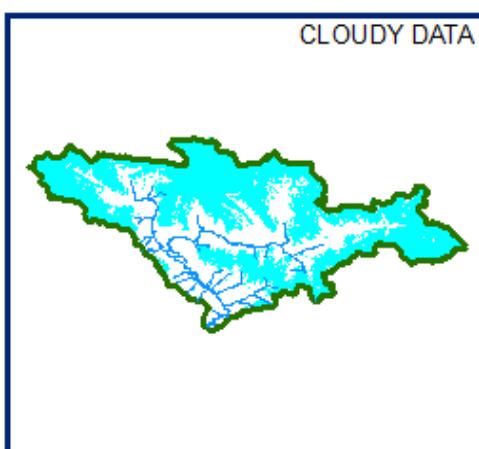
15 OCTOBER 2013



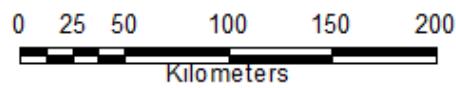
20 OCTOBER 2013



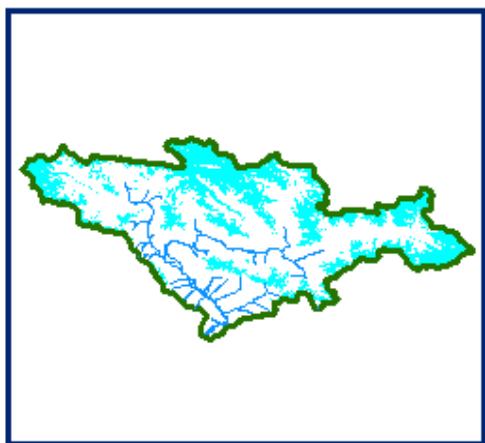
25 OCTOBER 2013



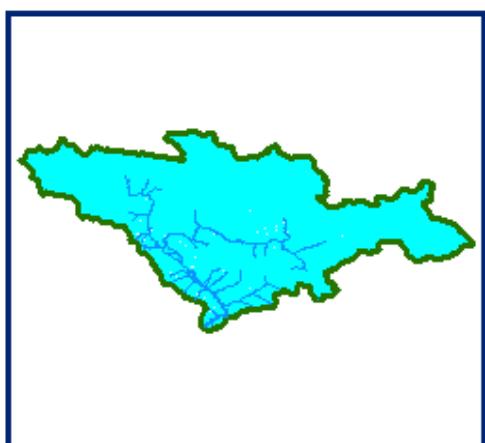
28 OCTOBER 2013



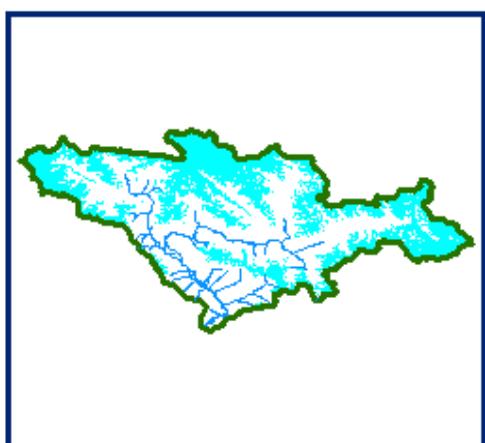
**10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED**  
**03 OCTOBER 2014**  
**06 OCTOBER 2014**  
**09 OCTOBER 2014**



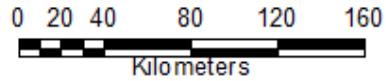
**DATA USED**  
**20 OCTOBER 2014**  
**15 OCTOBER 2014**  
**18 OCTOBER 2014**



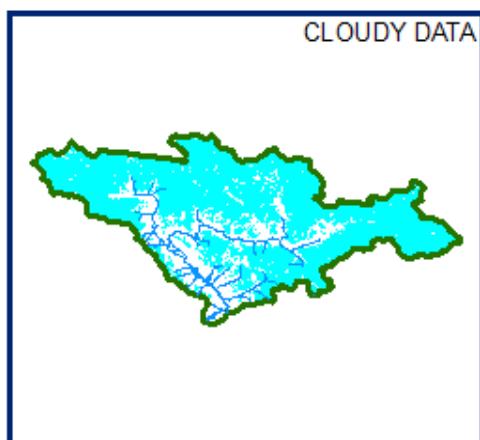
**DATA USED**  
**25 OCTOBER 2014**  
**28 OCTOBER 2014**  
**23 OCTOBER 2014**



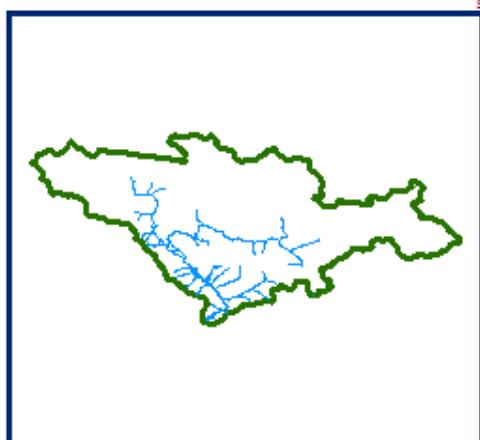
**SNOW**



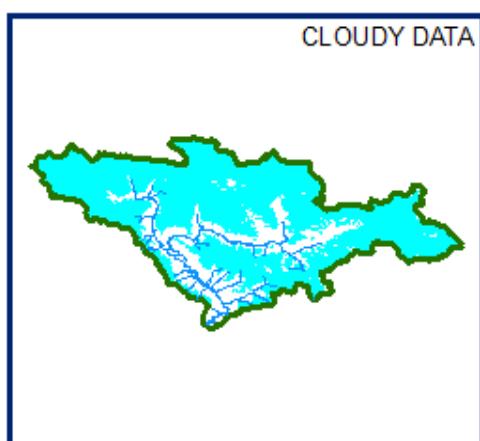
**SNOW COVER MAP : SHIGAR BASIN**



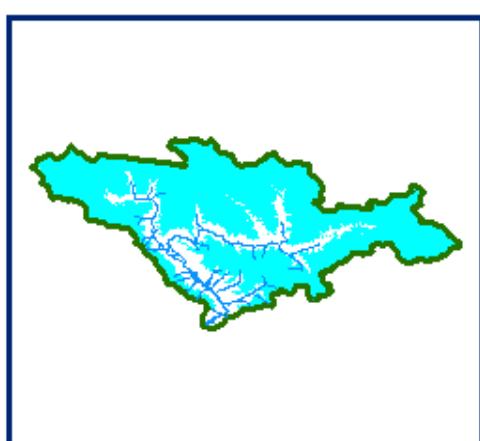
01 NOVEMBER 2013



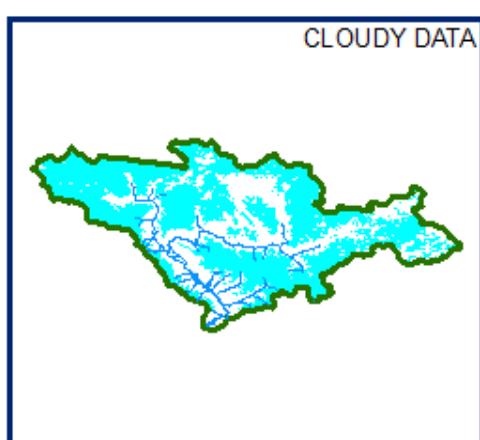
DATA NOT AVAILABLE



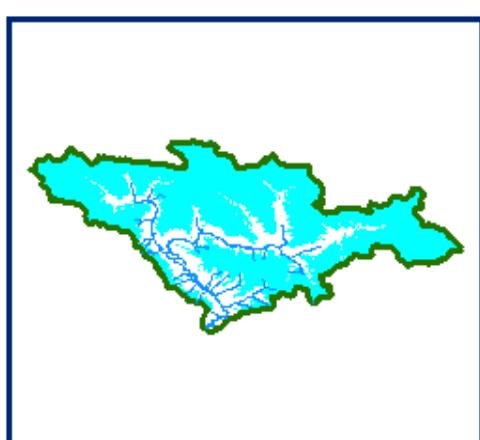
13 NOVEMBER 2013



20 NOVEMBER 2013



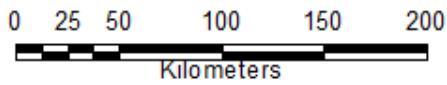
25 NOVEMBER 2013



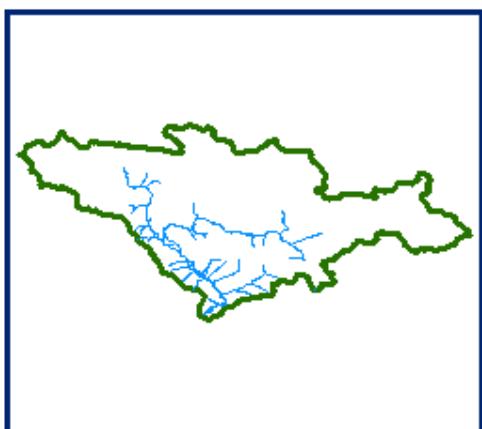
30 NOVEMBER 2013



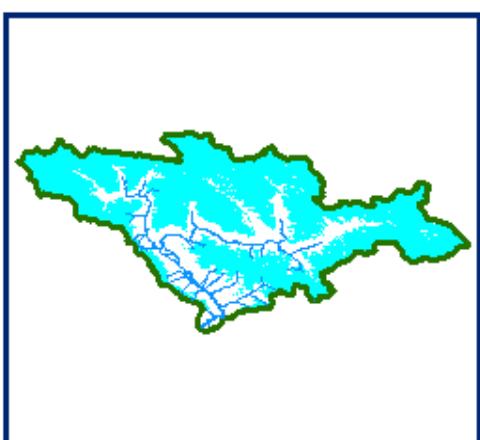
SNOW



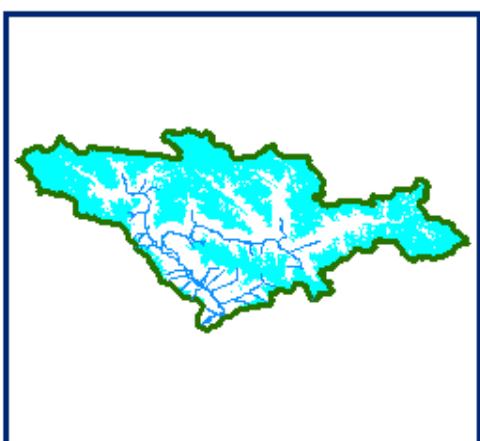
**10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED  
DATA NOT AVAILABLE**



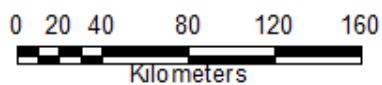
**DATA USED  
20 NOVEMBER 2013  
15 NOVEMBER 2013  
13 NOVEMBER 2013**



**DATA USED  
30 NOVEMBER 2013  
25 NOVEMBER 2013  
21 NOVEMBER 2013**

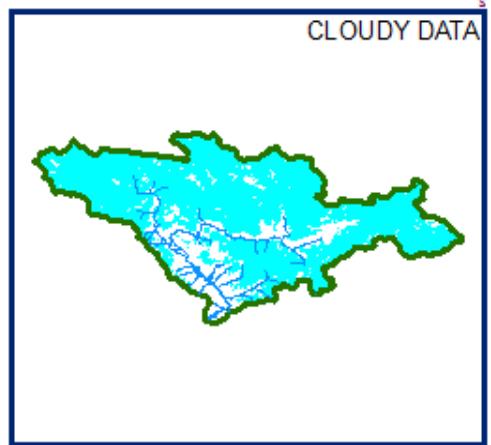
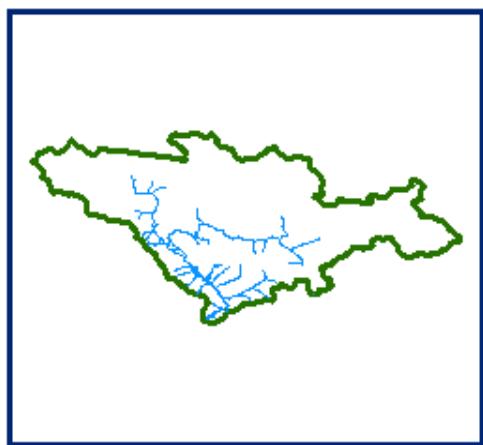


**SNOW**



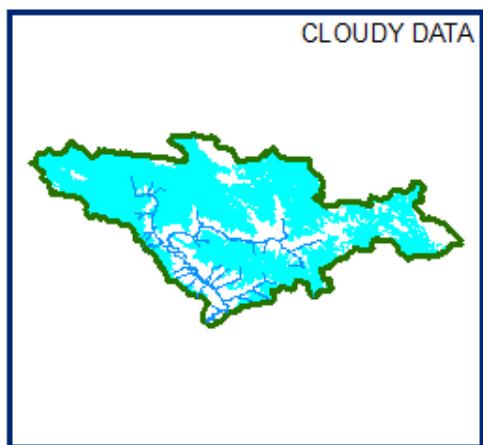
## SNOW COVER MAP

: SHIGAR BASIN



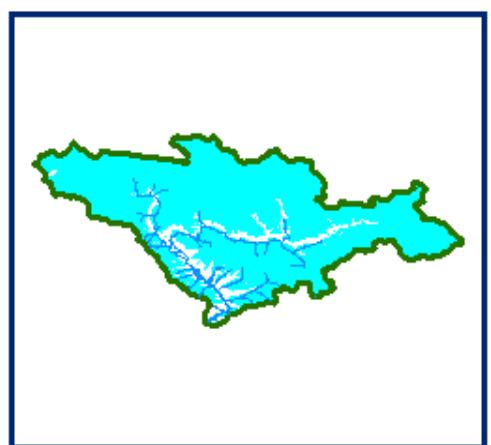
DATA NOT AVAILABLE

10 DECEMBER 2013

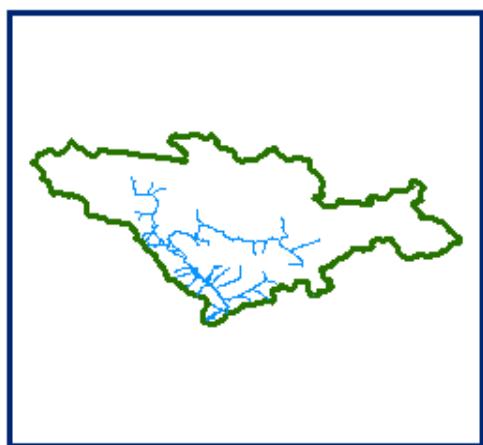


CLOUDY DATA

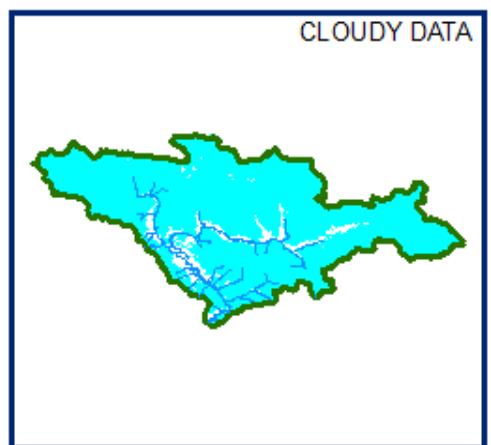
15 DECEMBER 2013



20 DECEMBER 2013



DATA NOT AVAILABLE



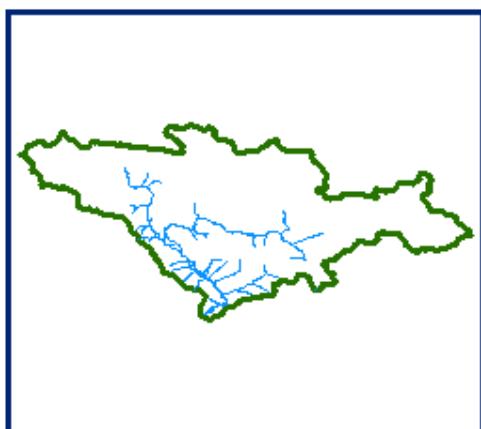
27 DECEMBER 2013



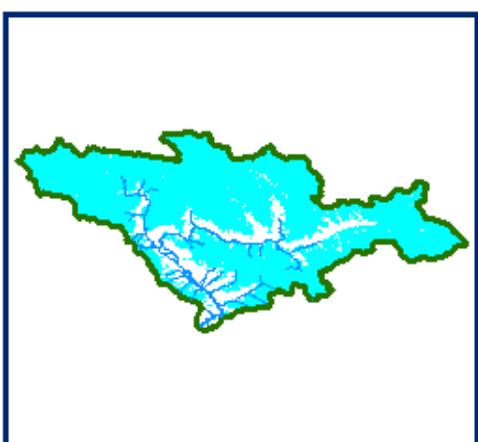
SNOW

0 25 50 100 150 200  
Kilometers

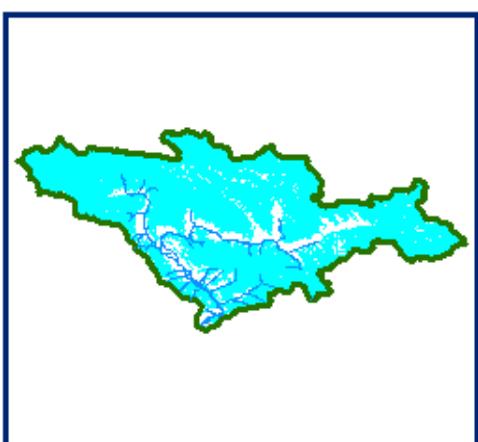
**10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
20 DECEMBER 2013  
15 DECEMBER 2013  
12 DECEMBER 2013**



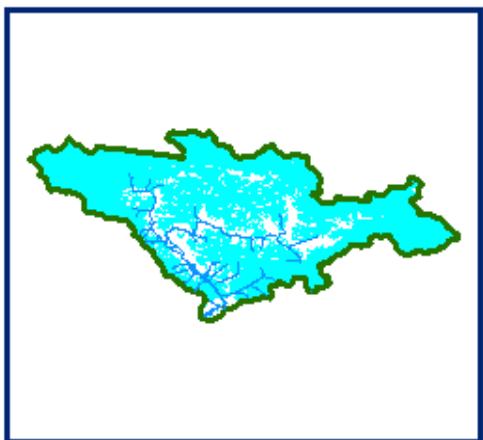
**DATA USED  
27 DECEMBER 2013  
26 DECEMBER 2013**



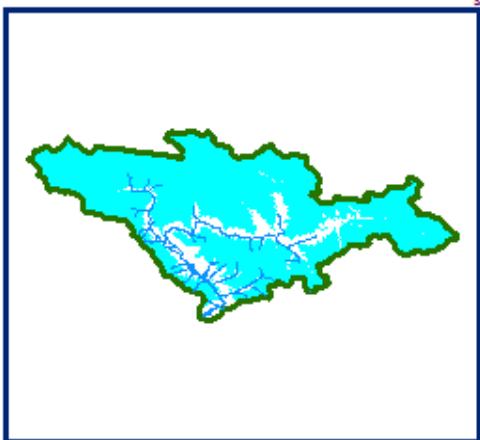
**SNOW**

0 20 40 80 120 160  
A horizontal scale bar with numerical markings at 0, 20, 40, 80, 120, and 160. Below the scale bar, the word "Kilometers" is written.

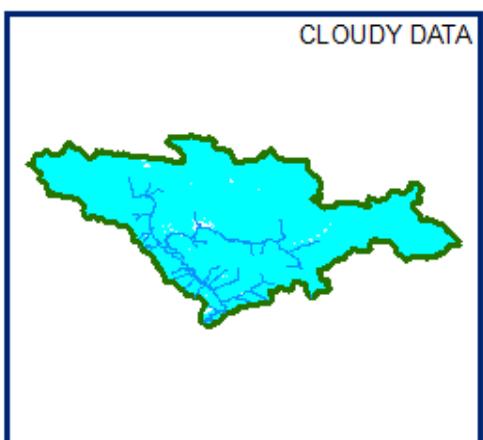
**SNOW COVER MAP : SHIGAR BASIN**



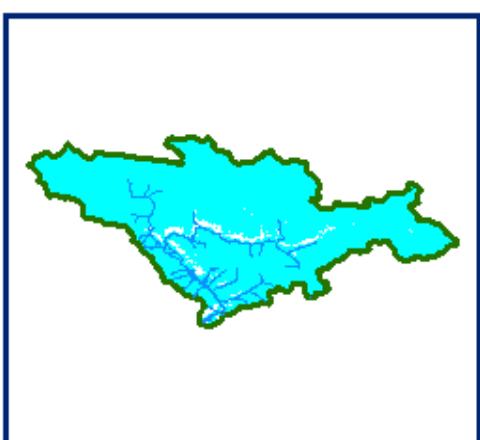
**02 JANUARY 2014**



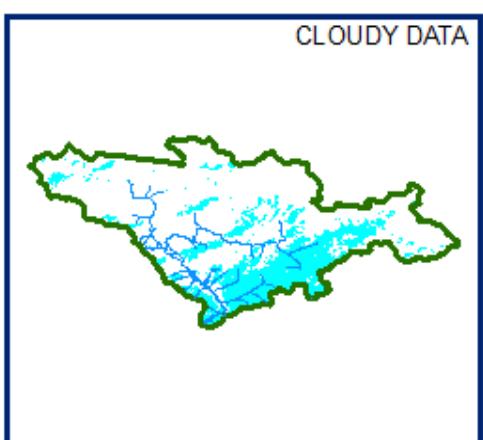
**07 JANUARY 2014**



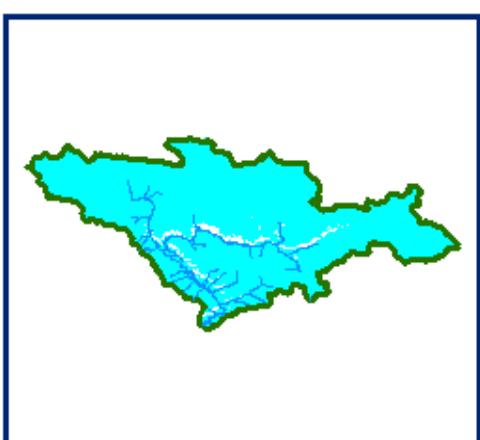
**15 JANUARY 2014**



**19 JANUARY 2014**



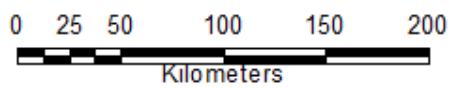
**24 JANUARY 2014**



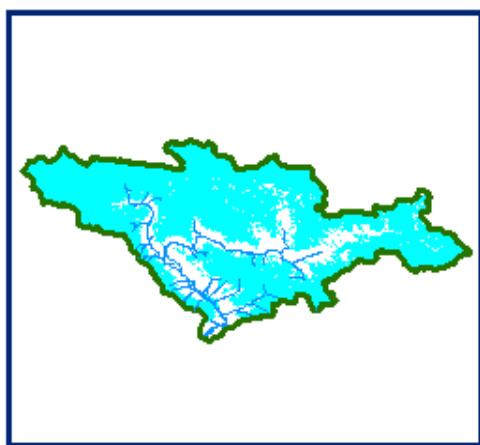
**29 JANUARY 2014**



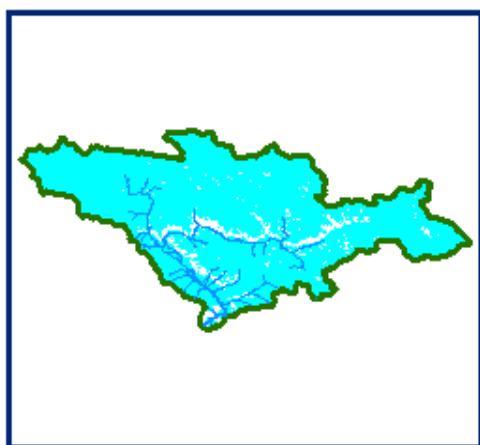
**SNOW**



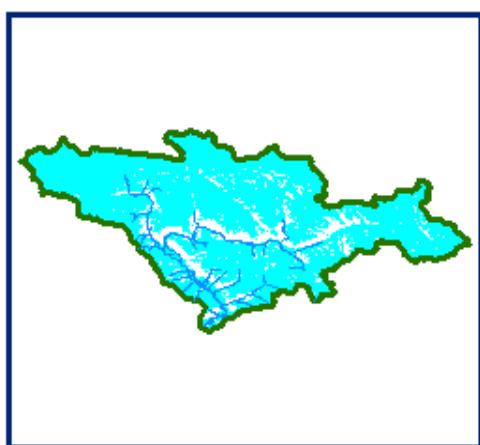
**10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED**  
**07 JANUARY 2014**  
**02 JANUARY 2014**



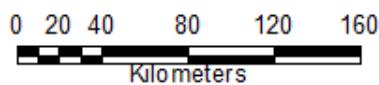
**DATA USED**  
**19 JANUARY 2014**  
**15 JANUARY 2014**



**DATA USED**  
**29 JANUARY 2014**  
**31 JANUARY 2014**  
**27 JANUARY 2014**

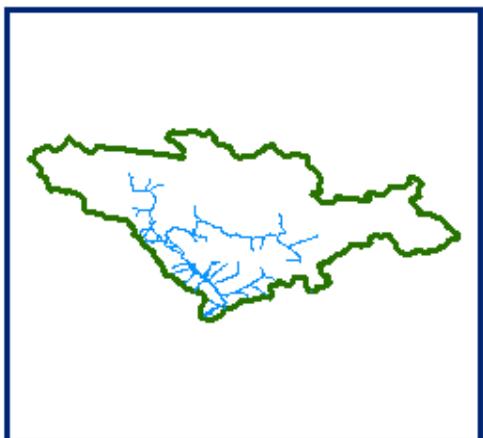


**SNOW**

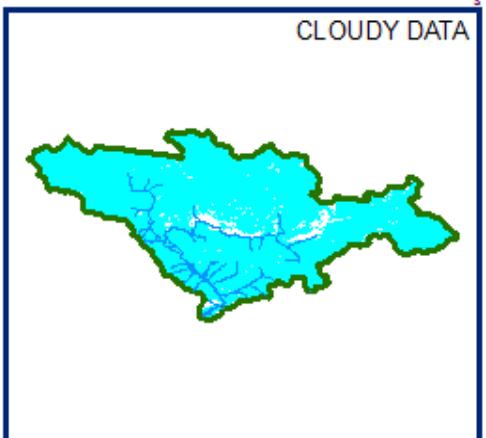


## SNOW COVER MAP

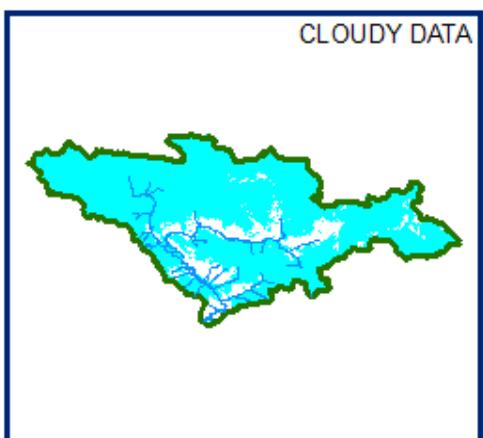
: SHIGAR BASIN



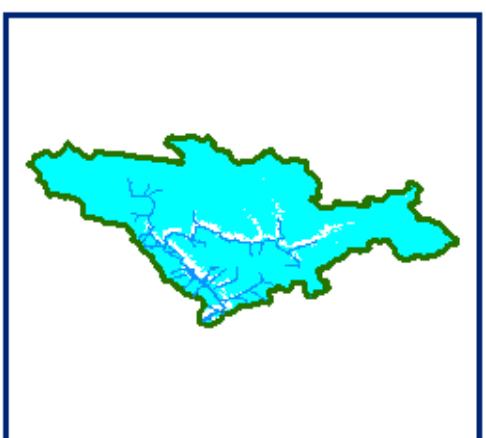
DATA NOT AVAILABLE



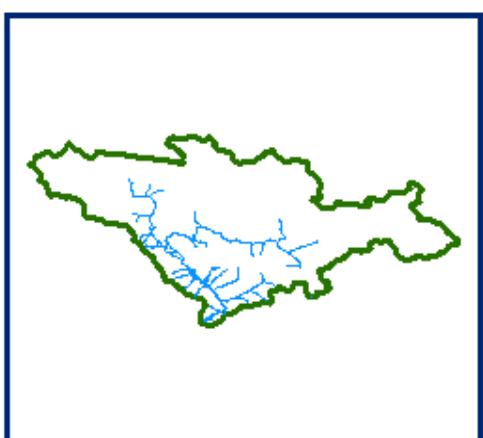
08 FEBRUARY 2014



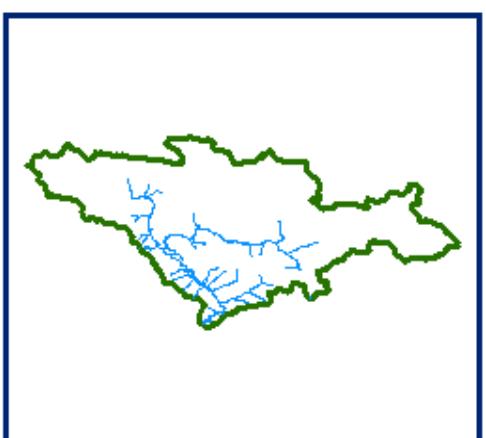
15 FEBRUARY 2014



17 FEBRUARY 2014



DATA NOT AVAILABLE



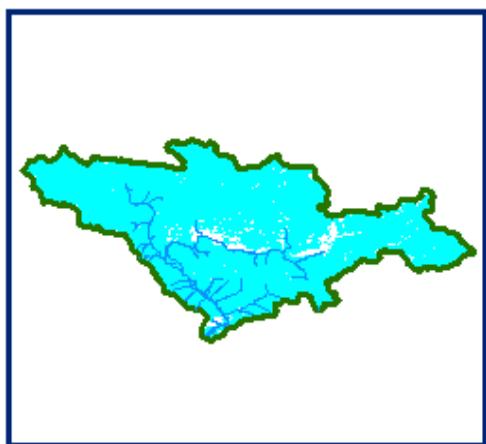
DATA NOT AVAILABLE



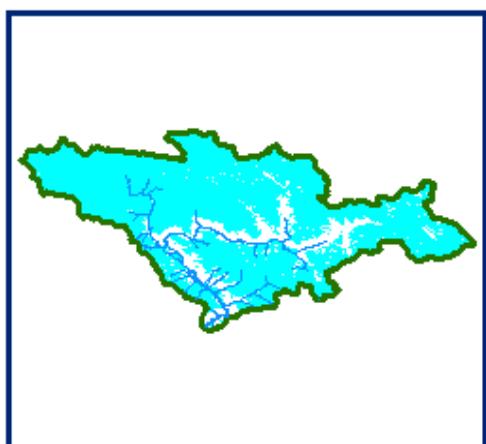
SNOW

0 25 50 100 150 200  
Kilometers

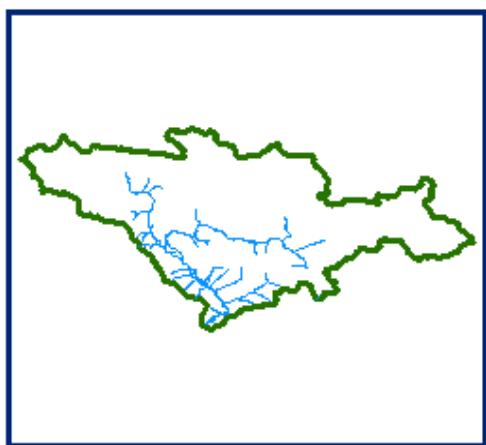
**10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED  
08 FEBRUARY 2014**



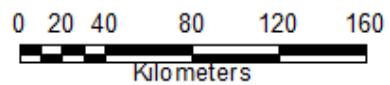
**DATA USED  
17 FEBRUARY 2014  
12 FEBRUARY 2014  
15 FEBRUARY 2014**



**DATA USED  
DATA NOT AVAILABLE**

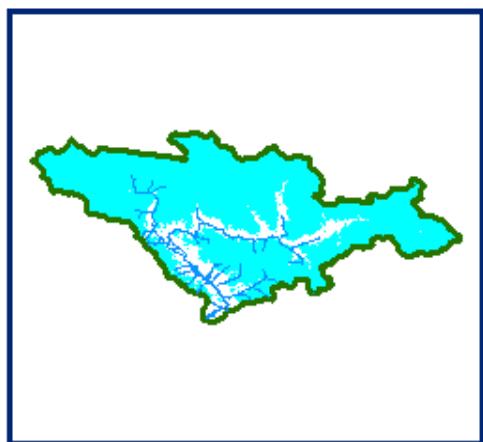


**SNOW**

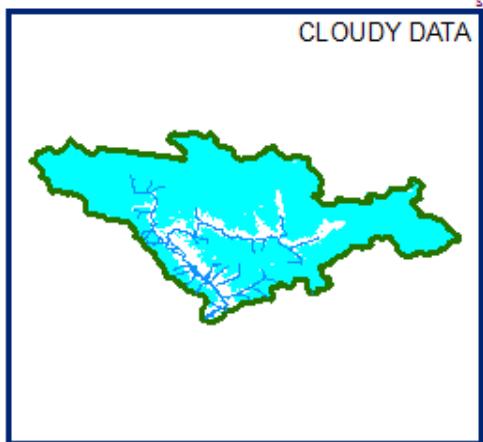


**SNOW COVER MAP**

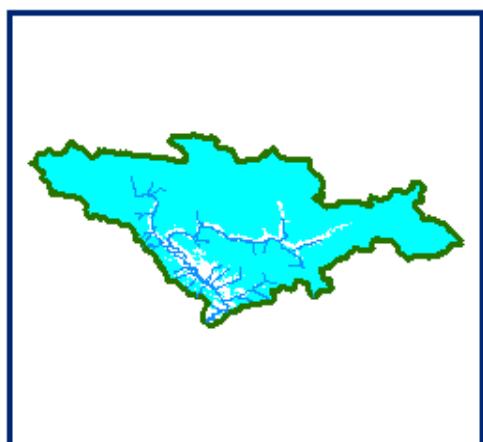
: SHIGAR BASIN



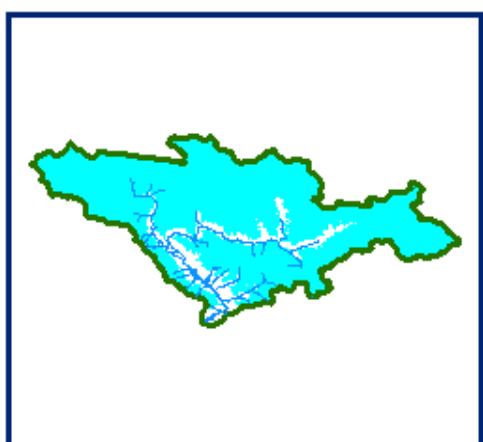
06 MARCH 2014



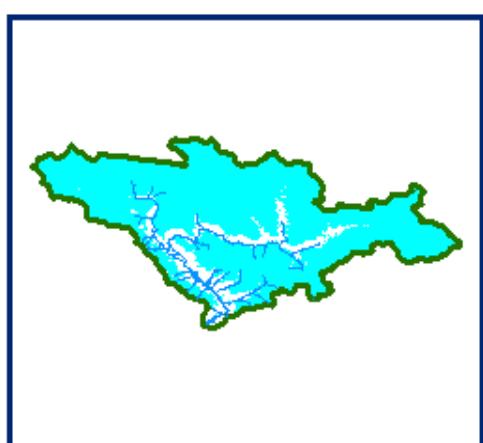
08 MARCH 2014



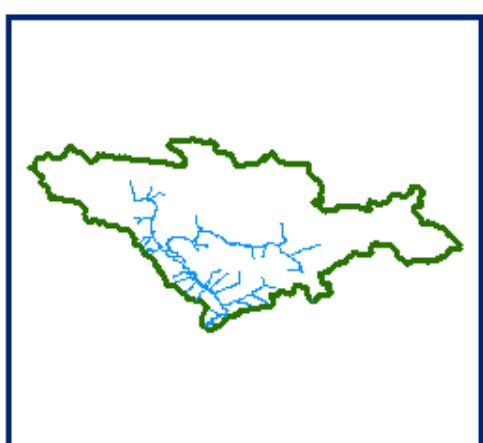
13 MARCH 2014



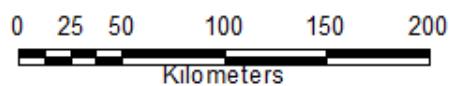
20 MARCH 2014



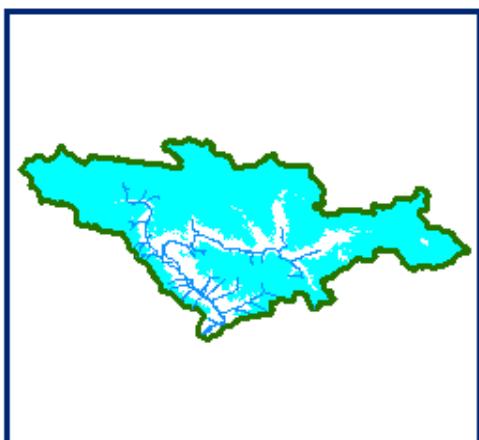
23 MARCH 2014



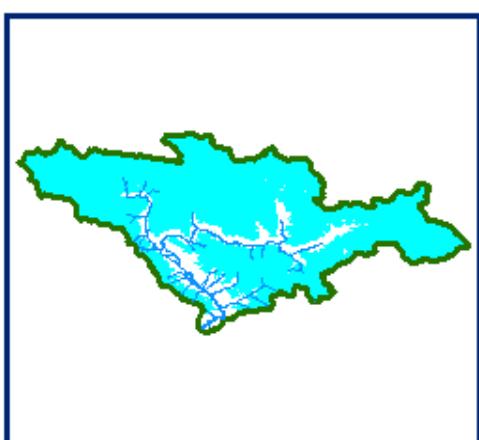
SNOW



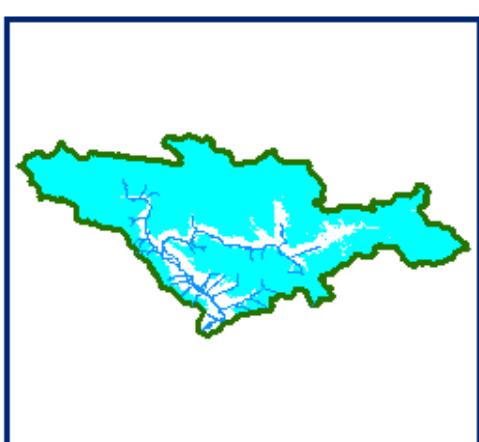
**10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED  
06 MARCH 2014  
08 MARCH 2014**



**DATA USED  
20 MARCH 2014  
13 MARCH 2014**



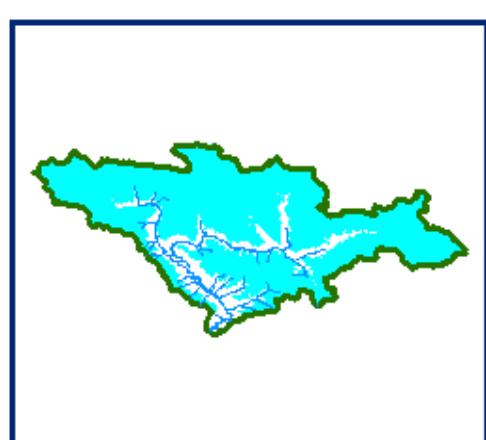
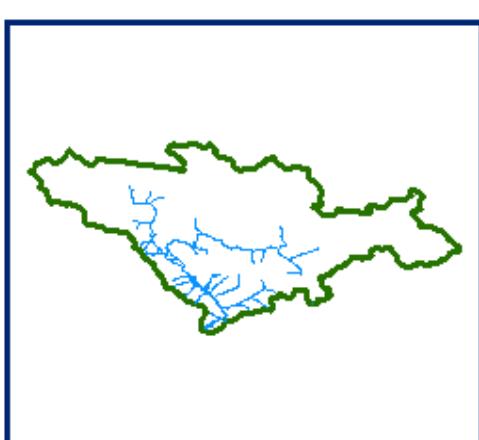
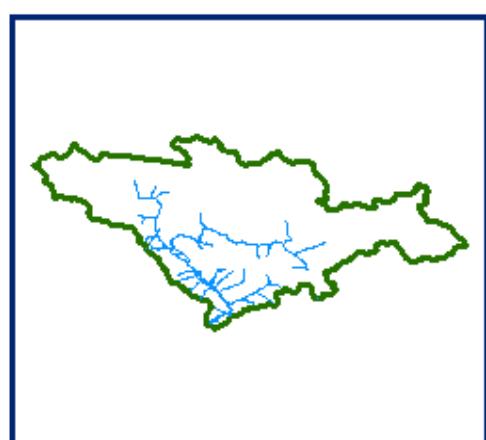
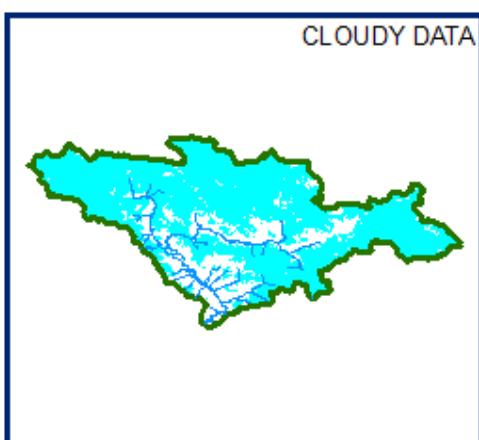
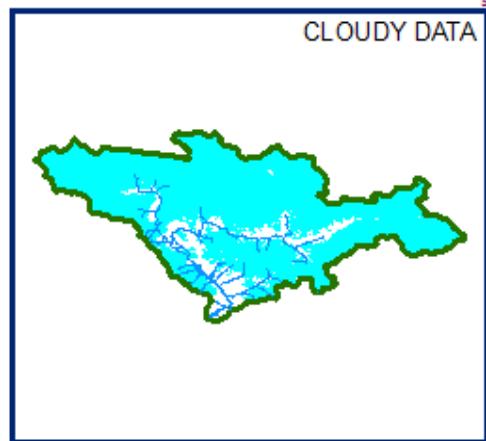
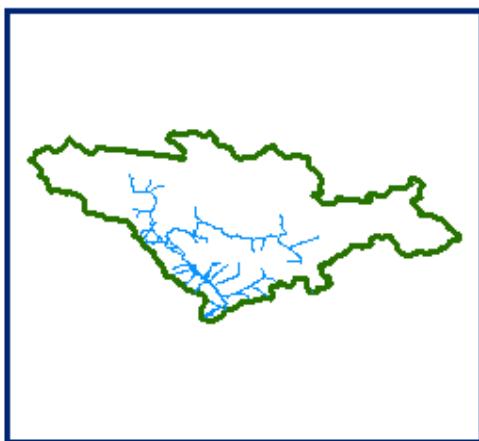
**DATA USED  
23 MARCH 2014  
21 MARCH 2014**



**SNOW**

0 20 40 80 120 160  
Kilometers

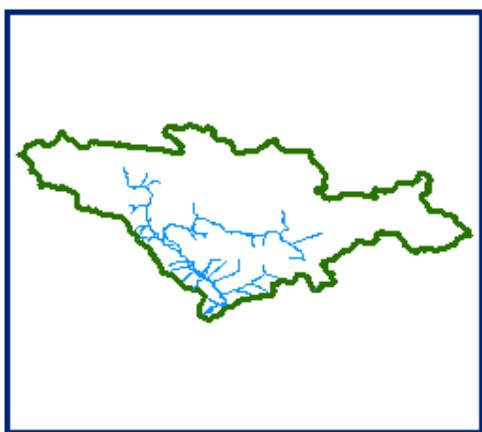
**SNOW COVER MAP : SHIGAR BASIN**



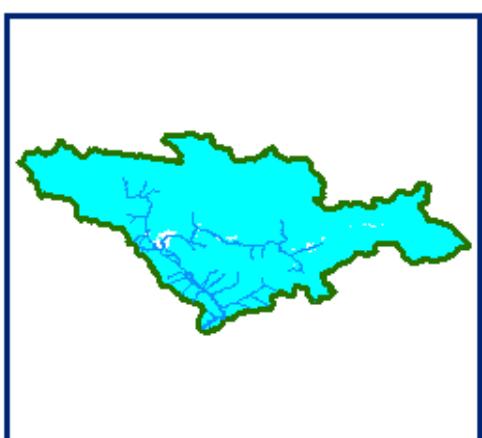
 SNOW

0 25 50 100 150 200  
Kilometers

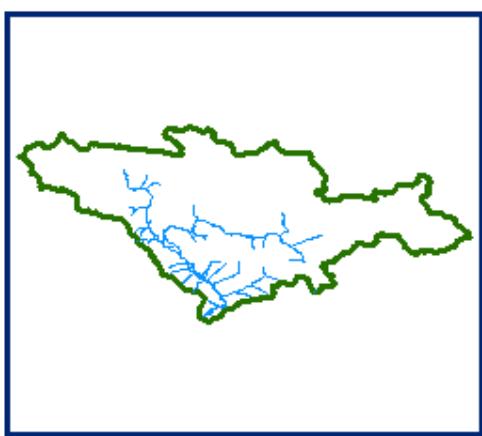
**10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
11 APRIL 2014  
13 APRIL 2014  
14 APRIL 2014**



**DATA USED  
DATA NOT AVAILABLE**

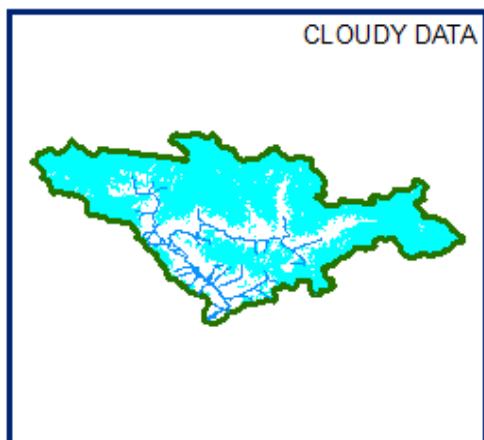


**SNOW**

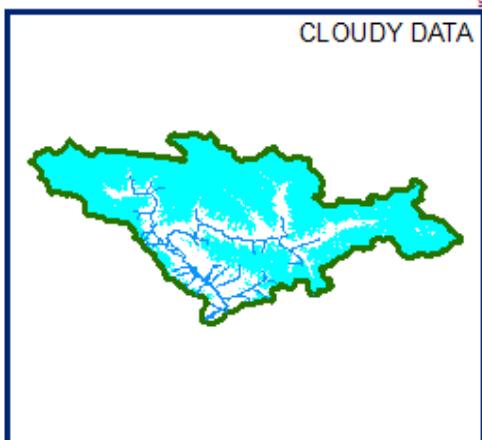
0 20 40 80 120 160  
A horizontal scale bar consisting of a black line with white tick marks at intervals of 20 units. Below the bar, the word "Kilometers" is written.

**SNOW COVER MAP**

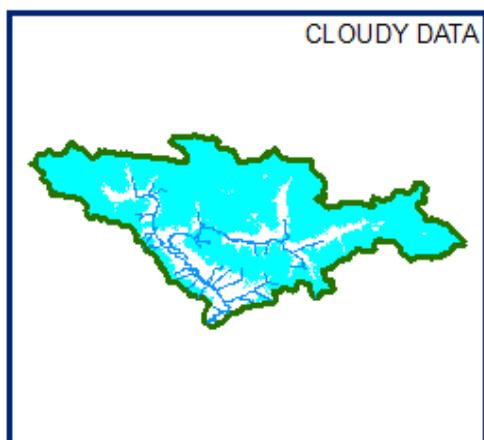
: SHIGAR BASIN



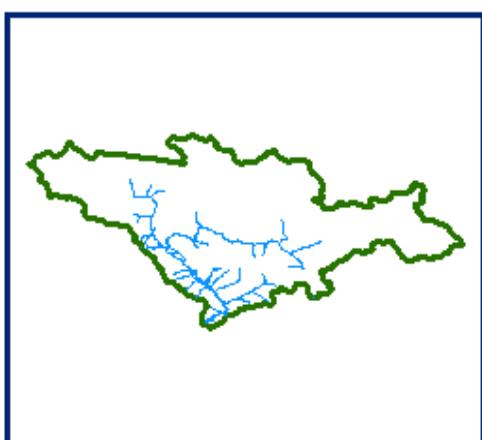
03 MAY 2014



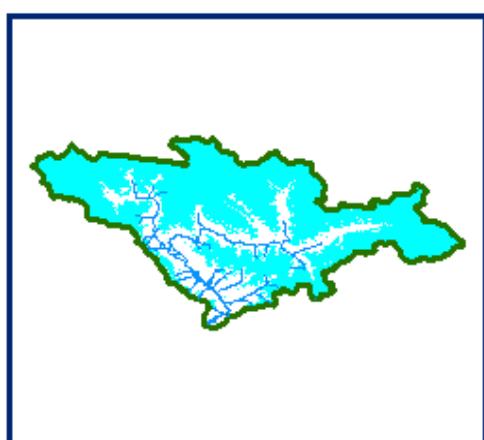
07 MAY 2014



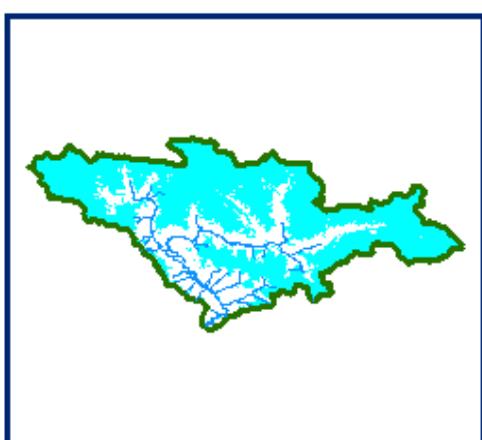
10 MAY 2014



DATA NOT AVAILABLE



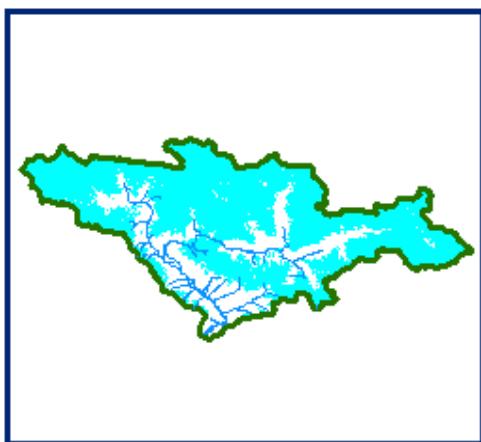
24 MAY 2014



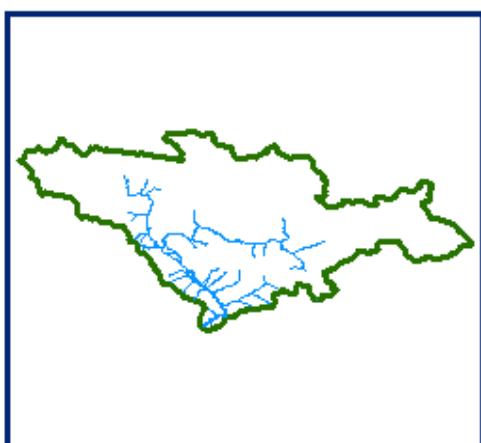
27 MAY 2014

0 25 50 100 150 200  
Kilometers

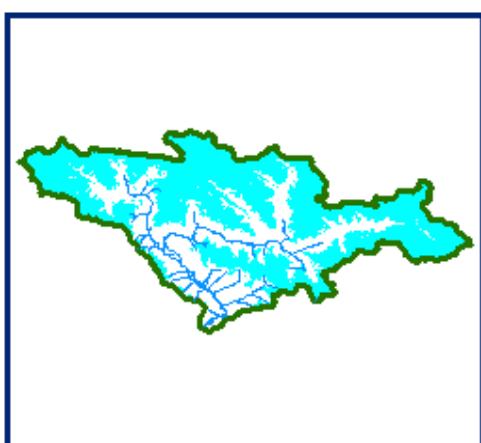
## **10 DAILY SNOW COVER MAP: SHIGAR BASIN**



**DATA USED  
10 MAY 2014  
03 MAY 2014  
07 MAY 2014**



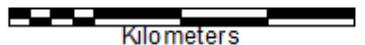
**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
29 MAY 2014  
27 MAY 2014  
24 MAY 2014**

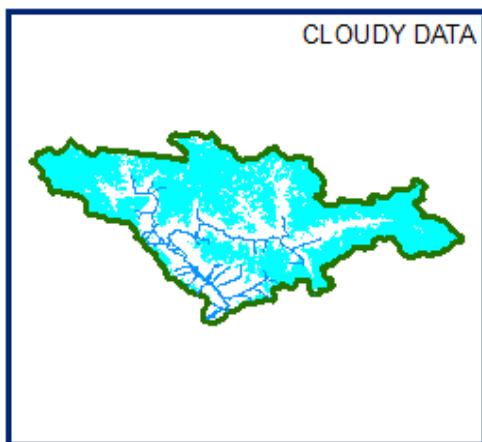
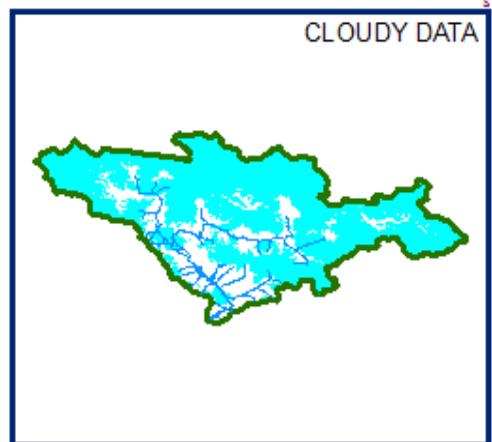
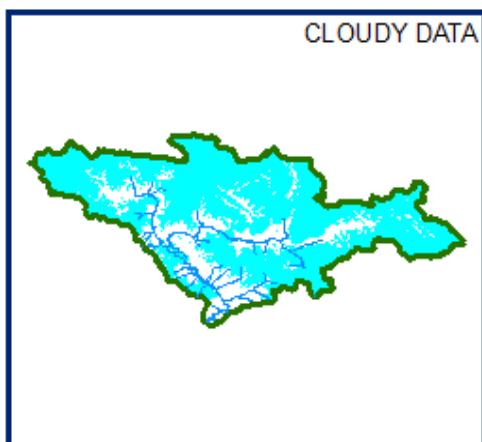
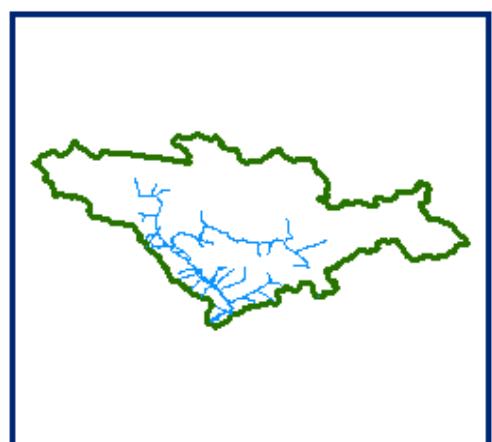
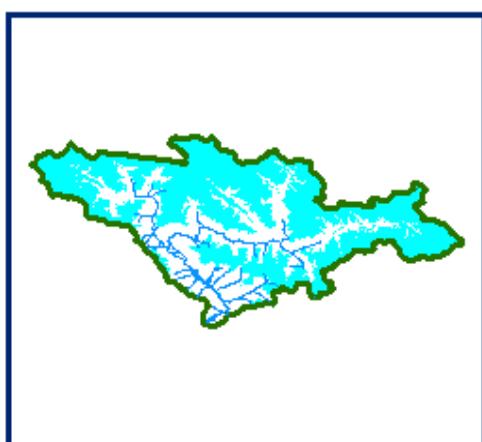
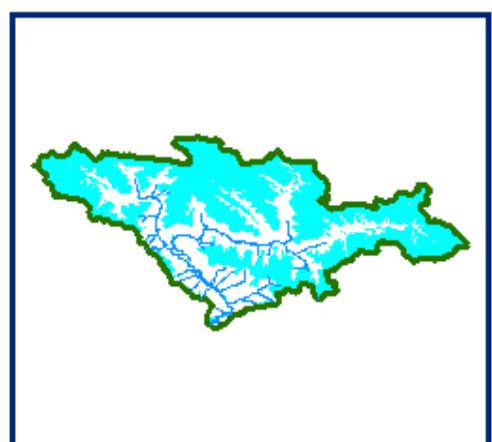
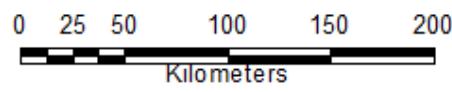
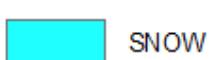


**SNOW**

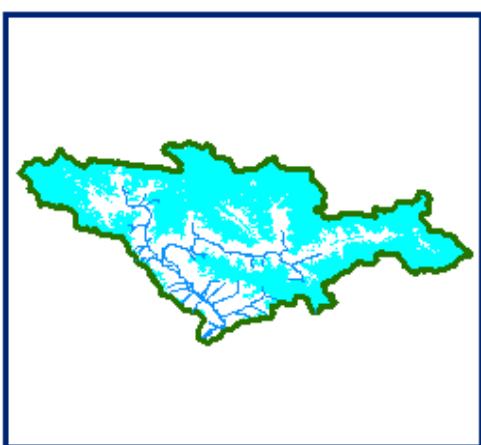
0 20 40 80 120 160  
  
Kilometers

**SNOW COVER MAP**

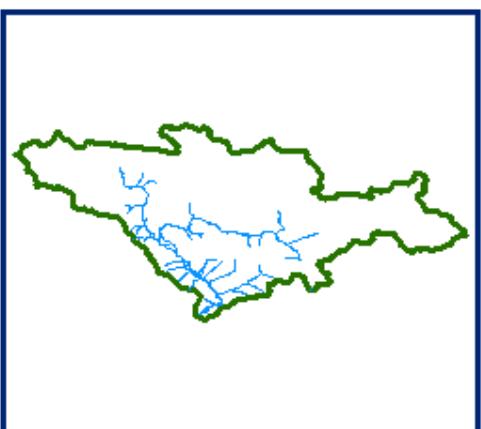
:

**SHIGAR BASIN****03 JUNE 2014****10 JUNE 2014****12 JUNE 2014****DATA NOT AVAILABLE****25 JUNE 2014****27 JUNE 2014**

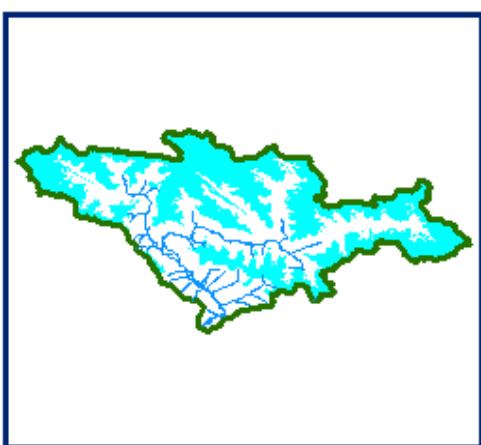
## 10 DAILY SNOW COVER MAP: SHIGAR BASIN



DATA USED  
03 JUNE 2014  
10 JUNE 2014  
05 JUNE 2014



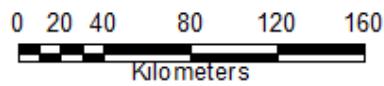
DATA USED  
DATA NOT AVAILABLE



DATA USED  
27 JUNE 2014  
25 JUNE 2014



SNOW



### AREAL EXTENT OF SNOW (5 DAILY)

**BASIN NAME: HANZA**

**BASIN AREA: 13711 sq. km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>							
1	03-Oct-13	3345	24	9	16-Oct-13	5000	36
2	04-Oct-13	4423	32	10	18-Oct-13	7059	51
3	05-Oct-13	6521	48	11	20-Oct-13	7078	52
4	06-Oct-13	3989	29	12	22-Oct-13	5590	41
5	08-Oct-13	3388	25	13	23-Oct-13	3865	28
6	10-Oct-13	4056	30	14	25-Oct-04	6033	44
7	11-Oct-13	2278	17	15	28-Oct-04	5613	41
8	15-Oct-13	6673	49				
<b>November 2013</b>							
16	1-Nov-13	6733	49	21	21-Nov-13	6728	49
17	10-Nov-13	7669	56	22	20-Nov-13	7177	52
18	13-Nov-13	6905	50	23	25-Nov-13	4952	36
19	15-Nov-13	8384	61	24	30-Nov-13	6666	48
20	16-Nov-13	7856	57				
<b>December 2013</b>							
25	04-Dec-13	7957	58	28	15-Dec-13	7354	54
26	10-Dec-13	5524	40	29	26-Dec-13	9850	72
27	14-Dec-13	6991	51	30	27-Dec-13	7299	53
<b>January 2014</b>							
31	2-Jan-14	9754	71	35	24-Jan-14	3062	22
32	7-Jan-14	9385	68	36	27-Jan-14	10496	77
33	17-Jan-14	8704	63	37	29-Jan-14	10906.	80
34	19-Jan-14	10898	79	38	31-Jan-14	6028	44
<b>February 2014</b>							
39	10-Feb-14	8907	65	41	15-Feb-14	7367	54
40	14-Feb-14	7586	55	42	17-Feb-14	9714	71
<b>March 2014</b>							
43	06-Mar-14	10049	73	46	20-Mar-14	11256	82
44	08-Mar-14	8686	63	47	21-Mar-14	9923	72
45	13-Mar-14	10516	77	48	23-Mar-14	10003	73
<b>April 2014</b>							
49	03-Apr-14	8254	60	53	14-Apr-14	8212	60
50	09-Apr-14	10622	77	54	28-Apr-14	10632	78

51	11-Apr-14	13408	98	55	30-Apr-14	7061	52
52	13-Apr-14	10898	79				
<b>May 2014</b>							
56	03-May-14	7662	56	60	26-May-14	7911	58
57	07-May-14	6238	45	61	27-May-14	7025	51
58	10-May-14	8443	62	62	29-May-14	7981	58
59	24-May-14	7928	58				
<b>June 2014</b>							
63	03-Jun-14	6916	50	68	14-Jun-14	6509	47
64	05-Jun-14	8233	60	69	24-Jun-14	6065	44
65	08-Jun-14	6720	49	70	26-Jun-14	6990	51
66	10-Jun-14	7513	55	71	27-Jun-14	6664	49
67	12-Jun-14	7468	54				

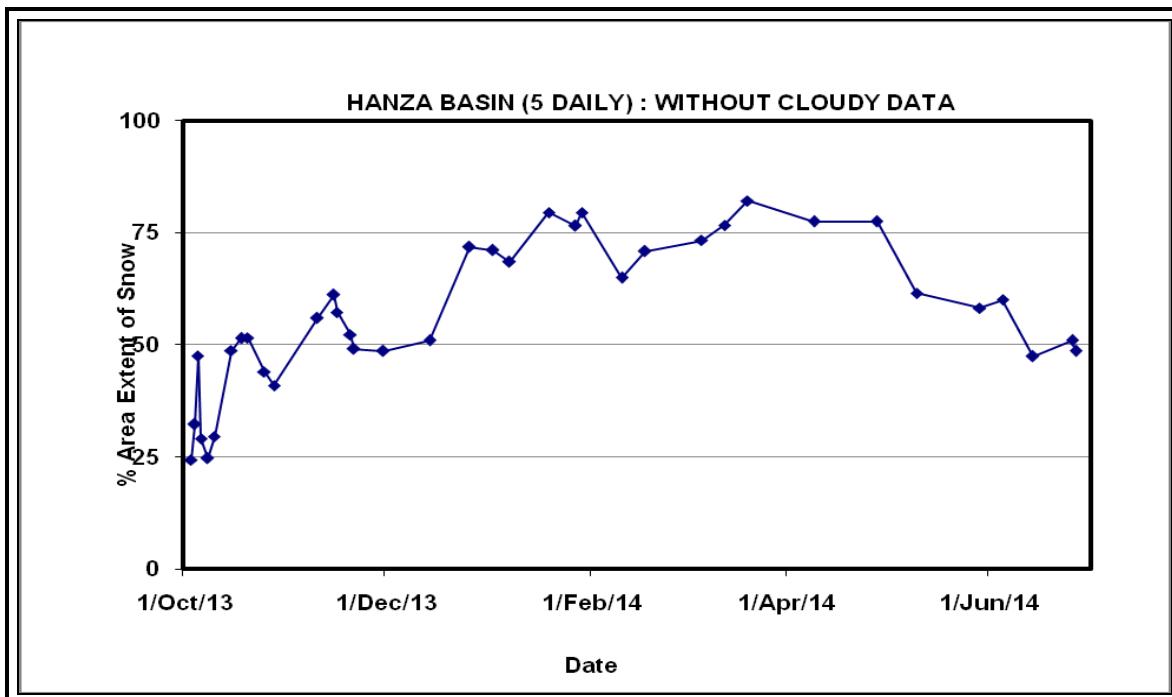
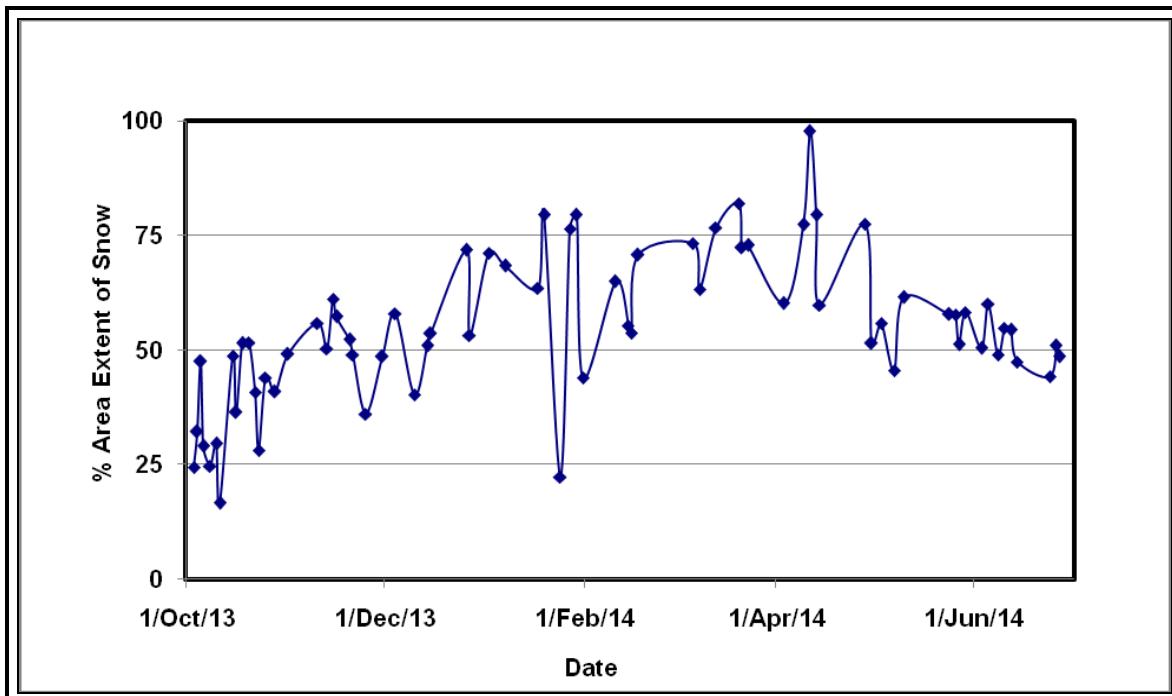
**AREAL EXTENT OF SNOW (10 DAILY)**

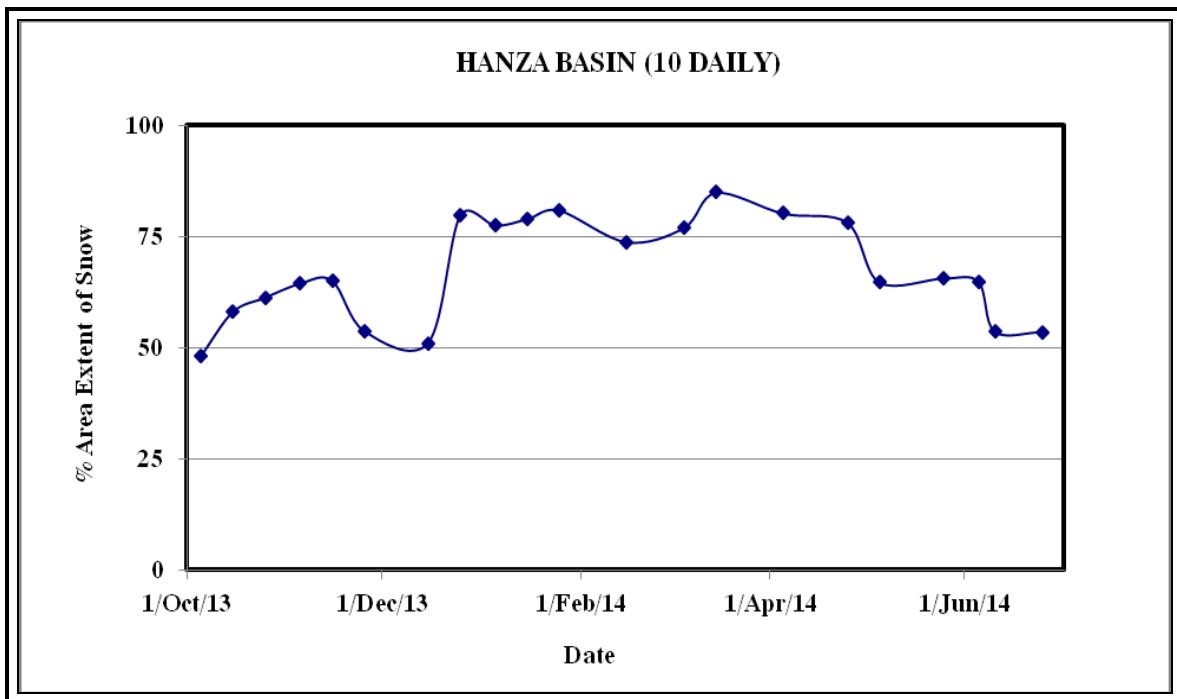
**BASIN NAME: HANZA**

**BASIN AREA: 13711 sq km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S. No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2014</b>				<b>November 2013</b>			
1	5-Oct-13	6521	48	4	5-Nov-13	8834	64
2	15-Oct-13	7955	58	5	15-Nov-13	8924	65
3	25-Oct-04	8394	61	6	25-Nov-13	7367	54
<b>December 2013</b>				<b>January 2014</b>			
7	15-Dec-13	7354	54	9	5-Jan-14	10634	78
8	25-Dec-13	10934	80	10	15-Jan-14	10898	79
				11	25-Jan-14	11097	81
<b>February 2014</b>				<b>March 2014</b>			
12	15-Feb-05	10116	74	13	5-Mar-14	10561	77
				14	15-Mar-14	11646	85
<b>April 2014</b>				<b>May 2014</b>			
15	5-Apr-14	11002	80	17	5-May-14	8870	65
16	25-Apr-14	10718	78	18	25-May-14	8992	66
<b>June 2014</b>							
19	5-Jun-14	8881	65				
20	15-Jun-14	7344	54				
21	25-Jun-14	7333	53				

### Snow cover depletion curve

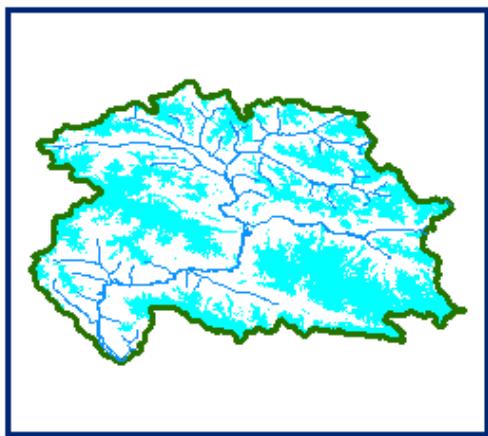




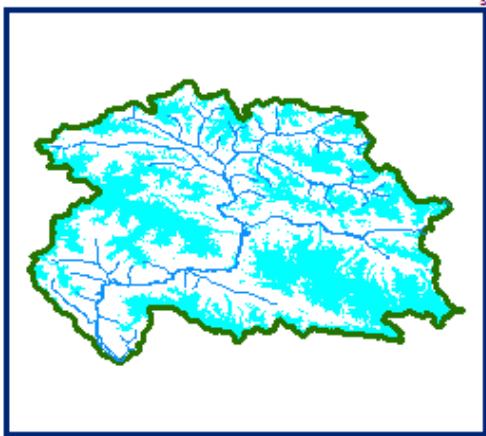
# *SNOW COVER MAP*

## SNOW COVER MAP

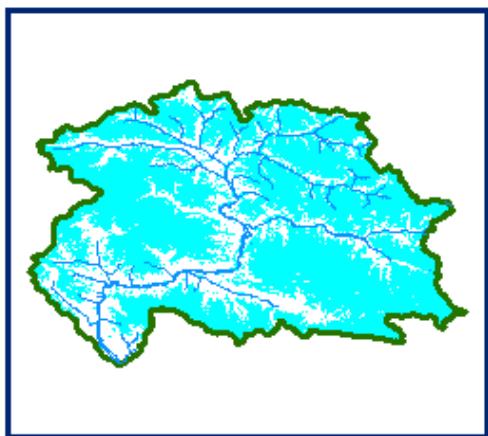
: HANZA BASIN



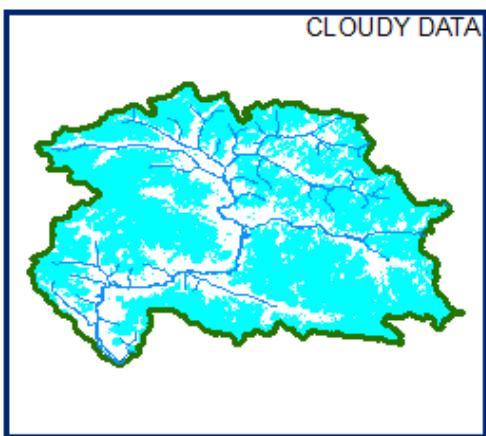
03 OCTOBER 2013



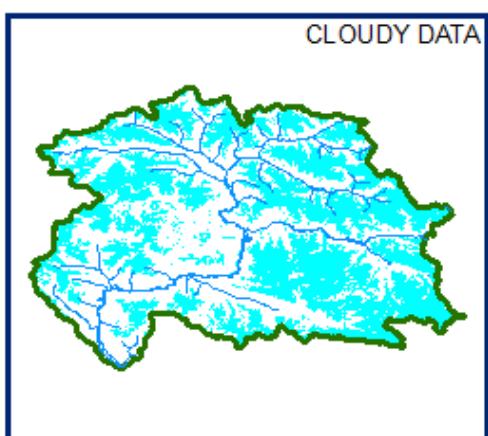
08 OCTOBER 2013



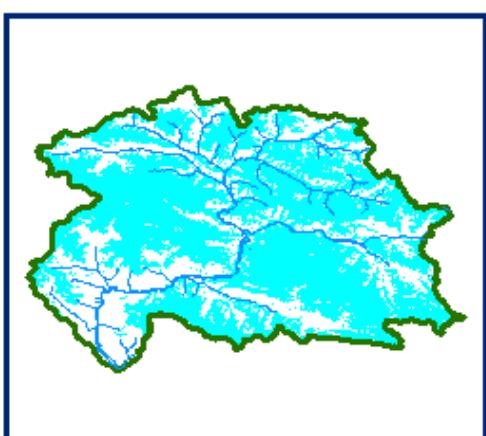
15 OCTOBER 2013



CLOUDY DATA  
18 OCTOBER 2013



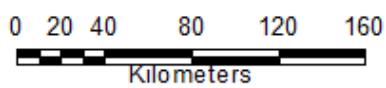
CLOUDY DATA  
23 OCTOBER 2013



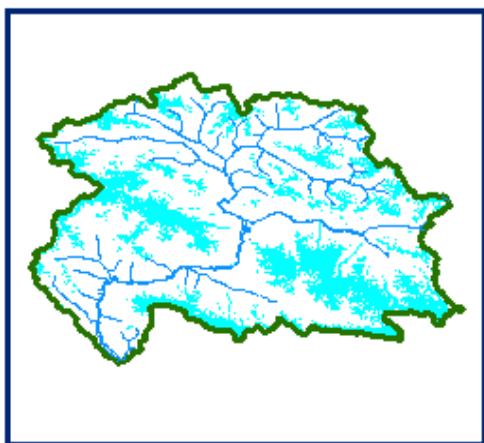
28 OCTOBER 2013



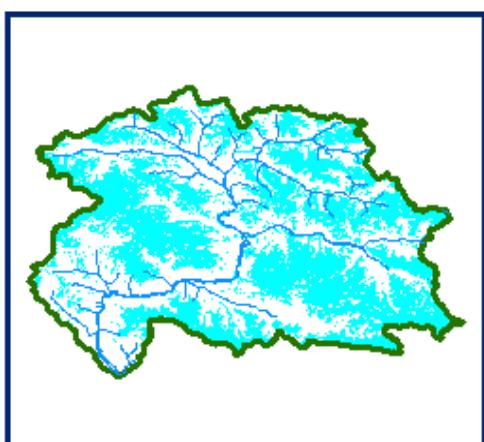
SNOW



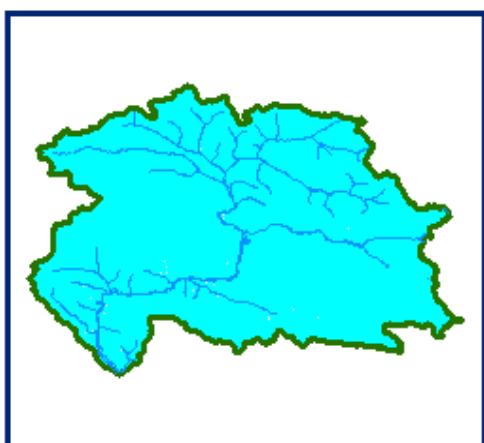
**10 DAILY SNOW COVER MAP: HANZA BASIN**



**DATA USED**  
**10 OCTOBER 2013**  
**03 OCTOBER 2013**  
**06 OCTOBER 2013**



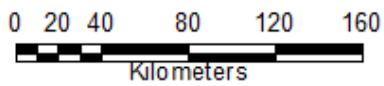
**DATA USED**  
**15 OCTOBER 2013**  
**16 OCTOBER 2013**  
**18 OCTOBER 2013**



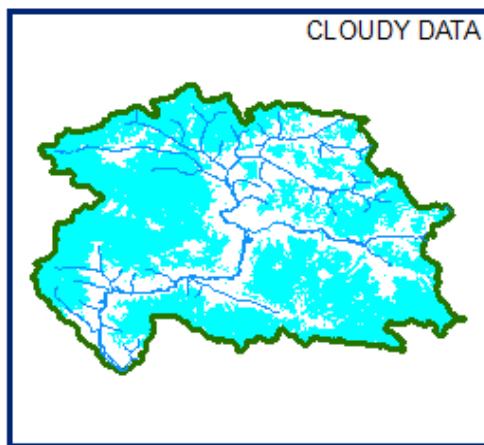
**DATA USED**  
**20 OCTOBER 2013**  
**23 OCTOBER 2013**  
**25 OCTOBER 2013**



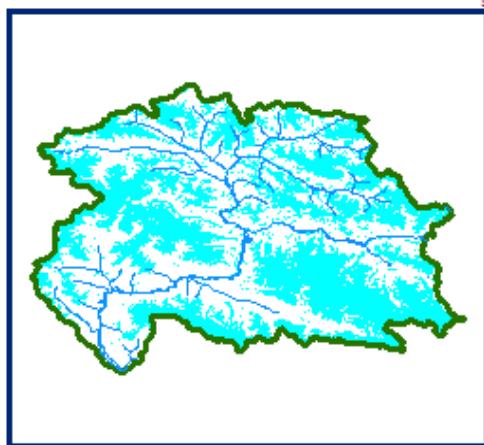
**SNOW**



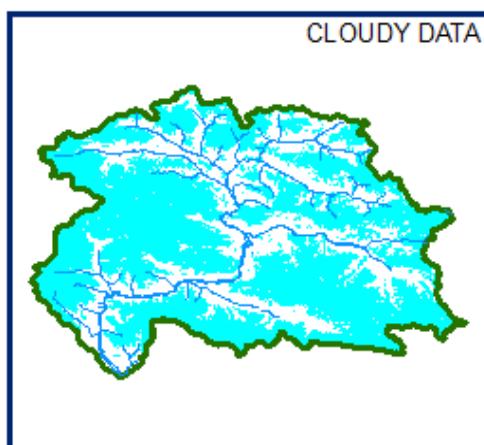
**SNOW COVER MAP : HANZA BASIN**



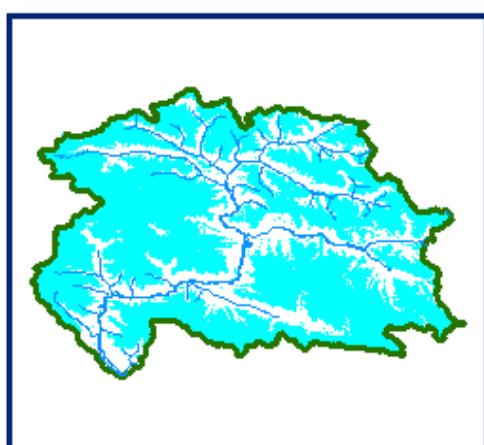
01 NOVEMBER 2013



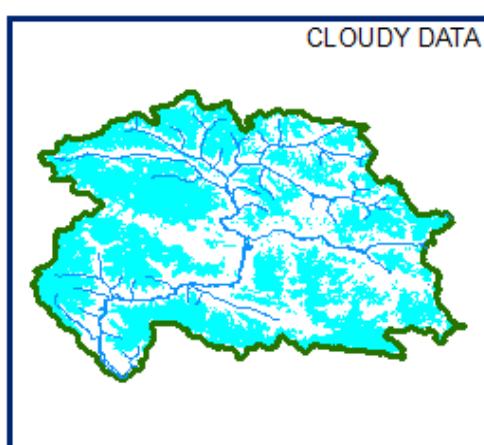
10 NOVEMBER 2013



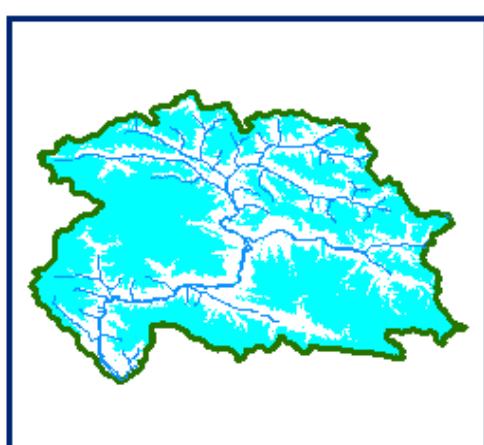
13 NOVEMBER 2013



20 NOVEMBER 2013



25 NOVEMBER 2013

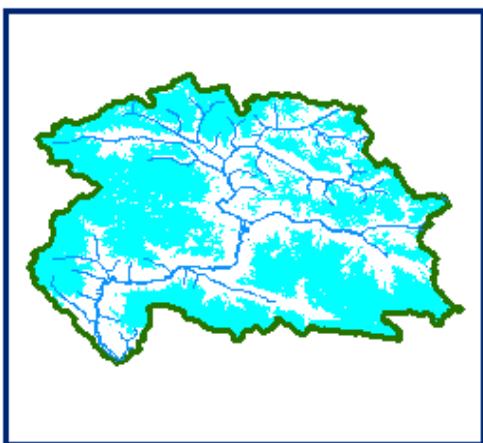


30 NOVEMBER 2013

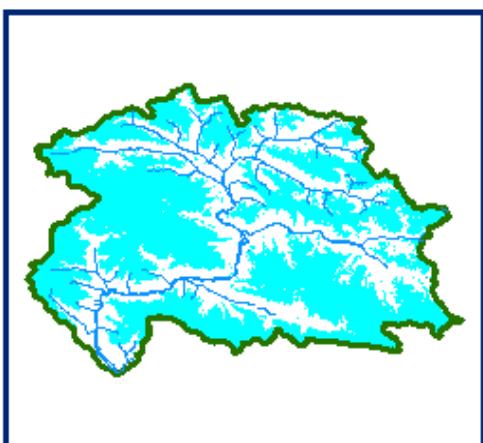
SNOW

0 20 40 80 120 160  
 Kilometers

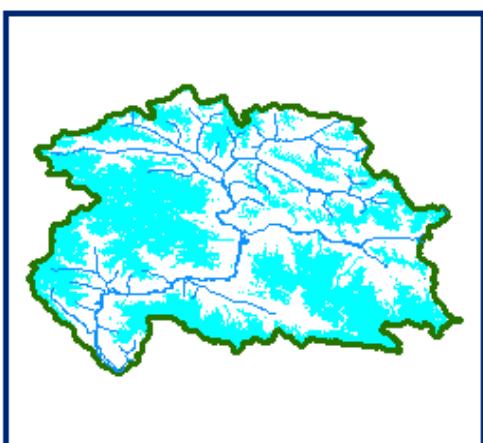
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



**DATA USED**  
**10 NOVEMBER 2014**  
**01 NOVEMBER 2014**



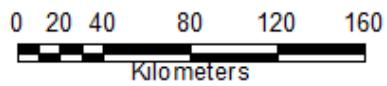
**DATA USED**  
**15 NOVEMBER 2014**  
**13 NOVEMBER 2014**  
**20 NOVEMBER 2014**



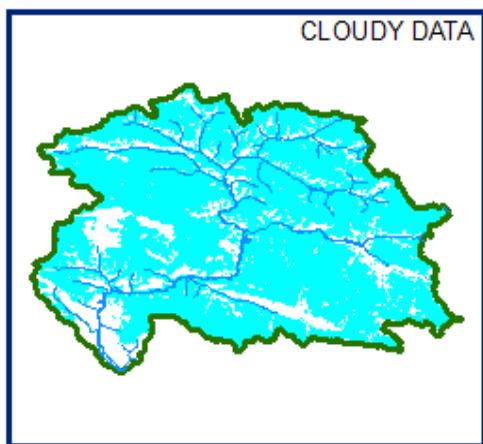
**DATA USED**  
**30 NOVEMBER 2014**  
**25 NOVEMBER 2014**



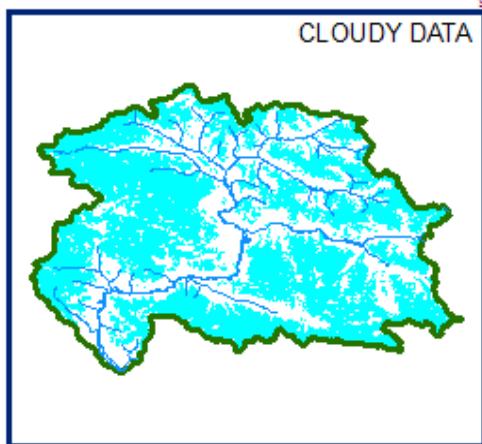
**SNOW**



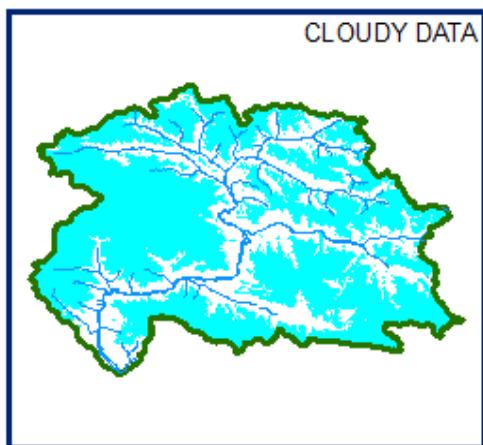
**SNOW COVER MAP : HANZA BASIN**



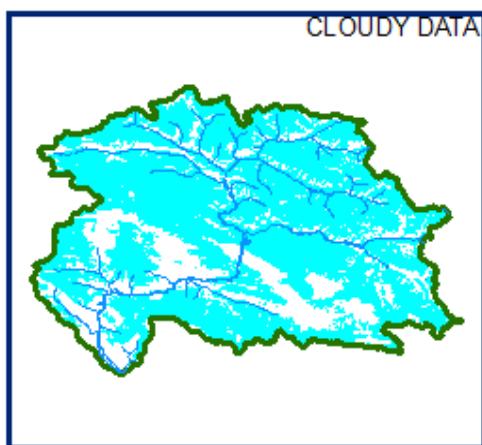
04 DECEMBER 2013



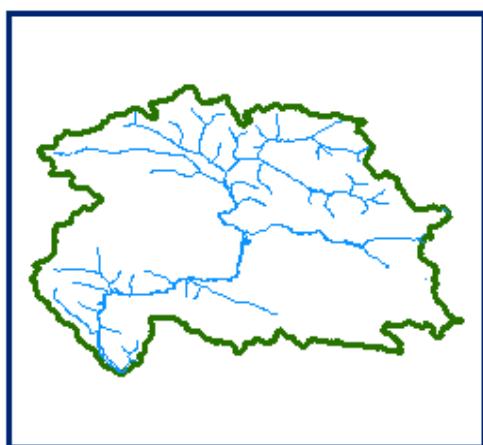
10 DECEMBER 2013



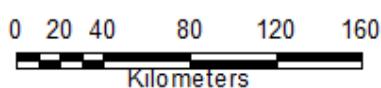
14 DECEMBER 2013



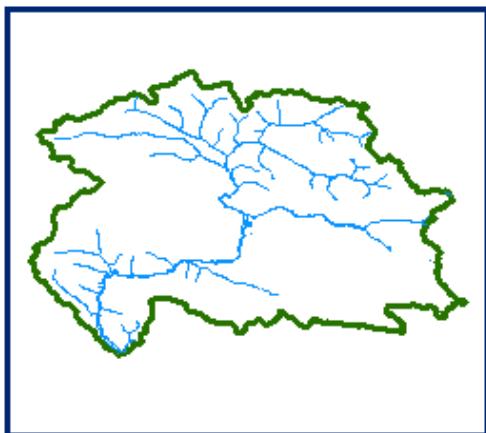
15 DECEMBER 2013



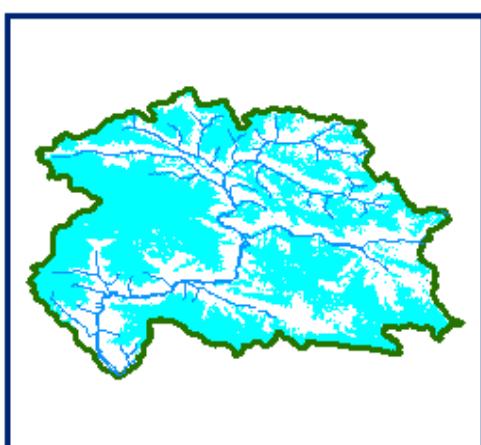
DATA NOT AVAILABLE



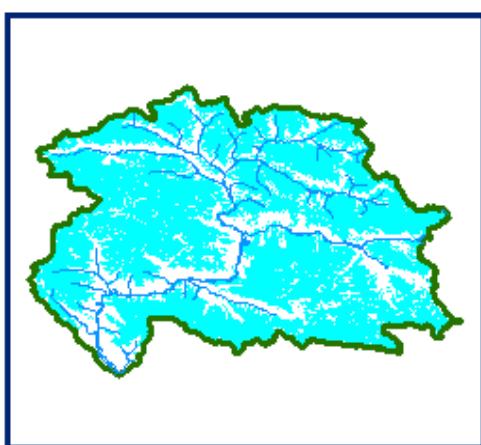
**10 DAILY SNOW COVER MAP: HANZA BASIN**



**DATA USED  
DATA NOT AVAILABLE**



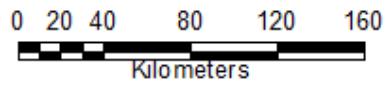
**DATA USED  
14 DECEMBER 2013  
15 DECEMBER 2013**



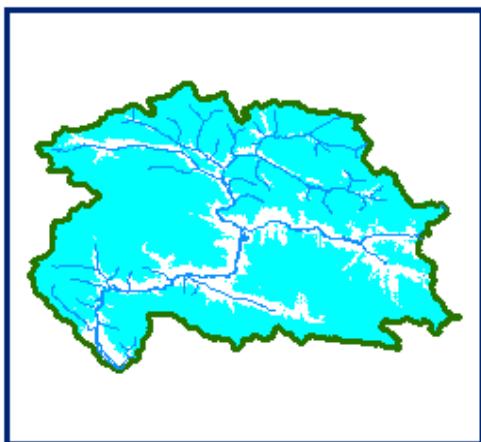
**DATA USED  
26 DECEMBER 2013  
27 DECEMBER 2013**



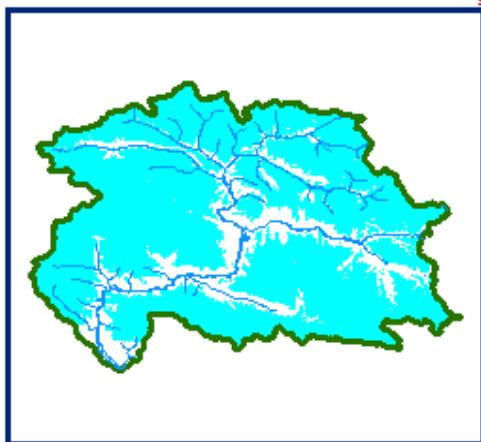
**SNOW**



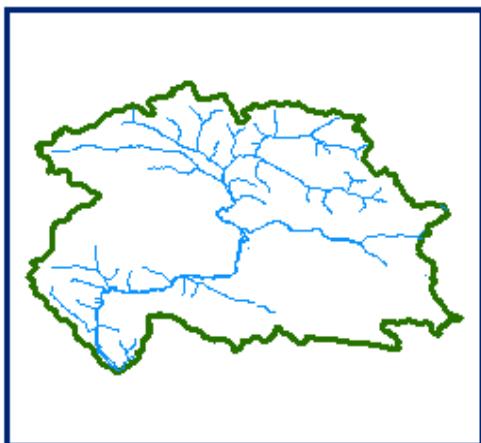
**SNOW COVER MAP : HANZA BASIN**



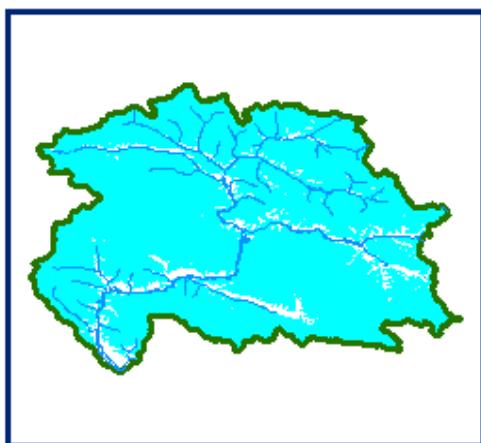
02 JANUARY 2014



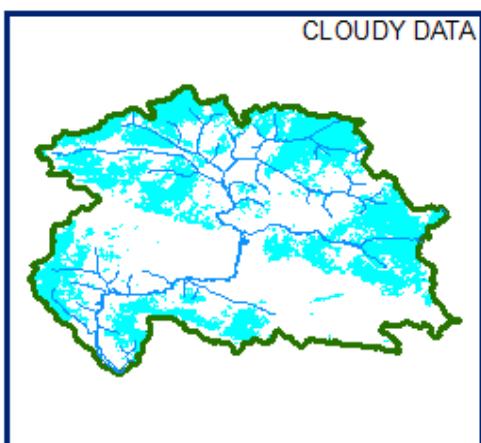
07 JANUARY 2014



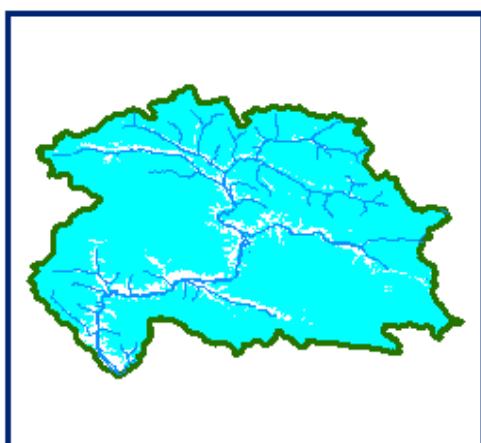
14 DECEMBER 2013



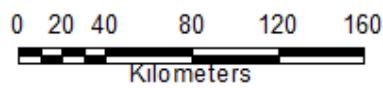
19 JANUARY 2014



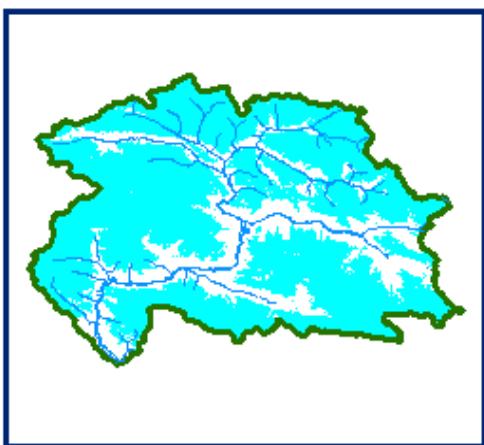
24 JANUARY 2014



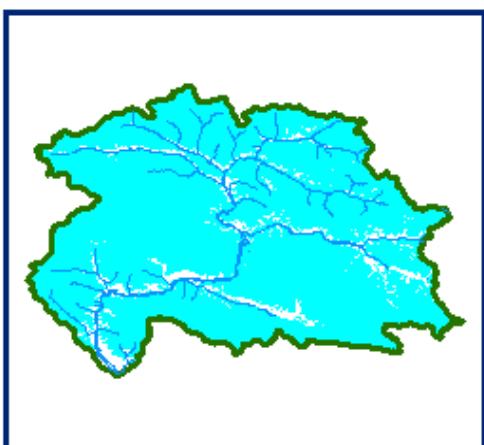
29 JANUARY 2014



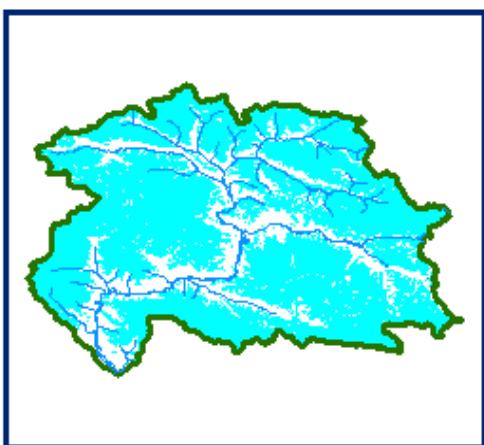
**10 DAILY SNOW COVER MAP: HANZA BASIN**



**DATA USED  
02 JANUARY 2014  
07 JANUARY 2014**

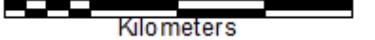


**DATA USED  
19 JANUARY 2014**

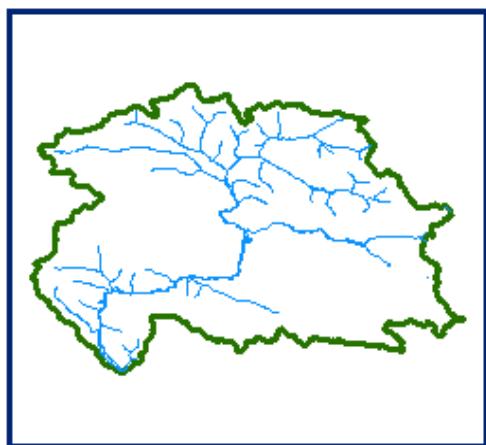


**DATA USED  
29 JANUARY 2014  
31 JANUARY 2014  
27 JANUARY 2014**

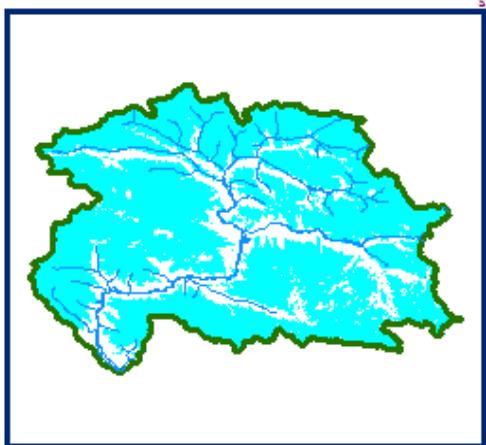


0 20 40 80 120 160  
 Kilometers

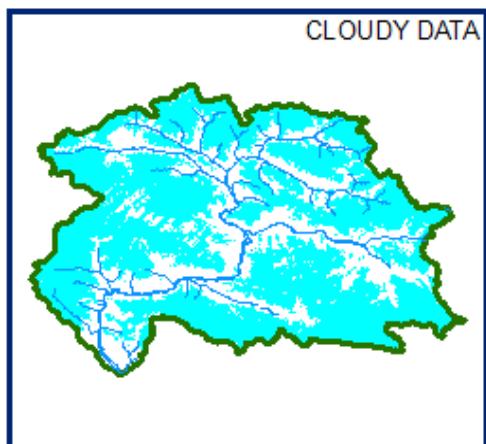
**SNOW COVER MAP : HANZA BASIN**



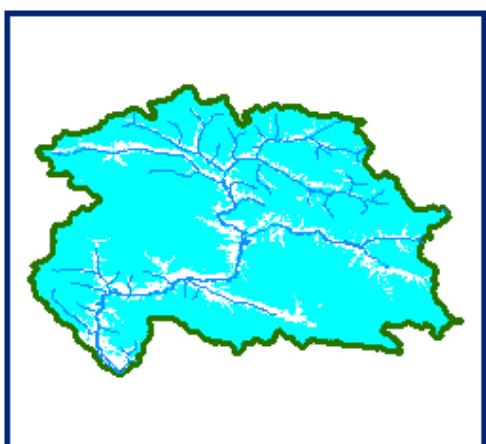
**DATA NOT AVAILABLE**



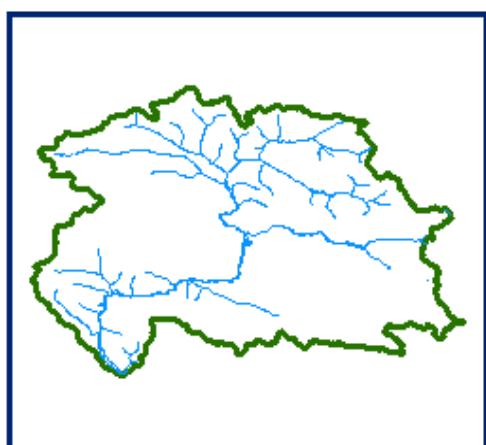
**10 FEBRUARY 2014**



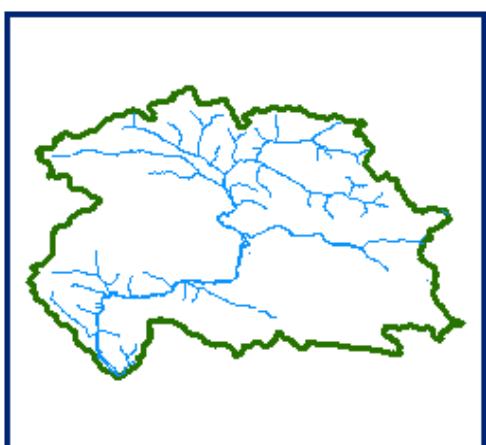
**CLOUDY DATA**



**17 FEBRUARY 2014**



**DATA NOT AVAILABLE**

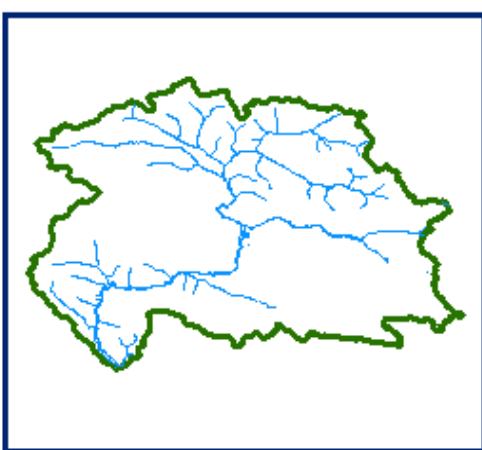


**DATA NOT AVAILABLE**

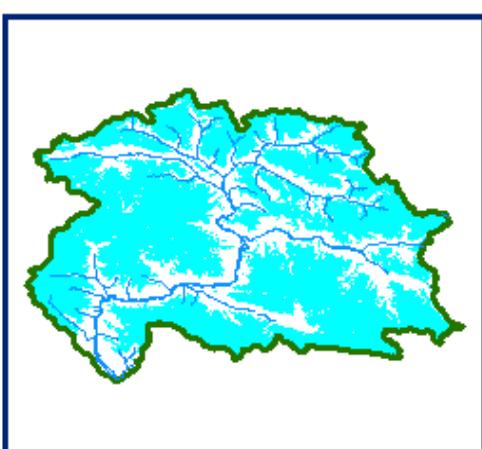


0 20 40 80 120 160  
Kilometers

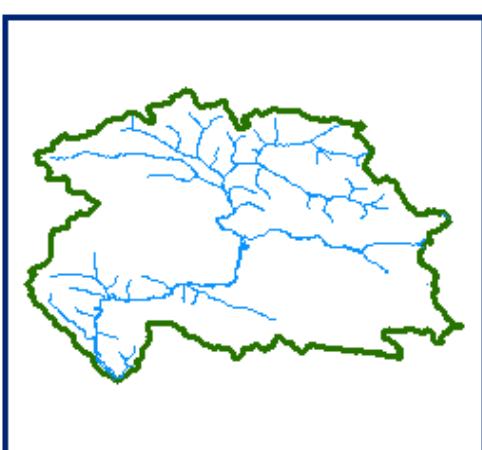
**10 DAILY SNOW COVER MAP: HANZA BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
17 FEBRUARY 2014  
15 FEBRUARY 2014  
12 FEBRUARY 2014**



**DATA USED  
DATA NOT AVAILABLE**



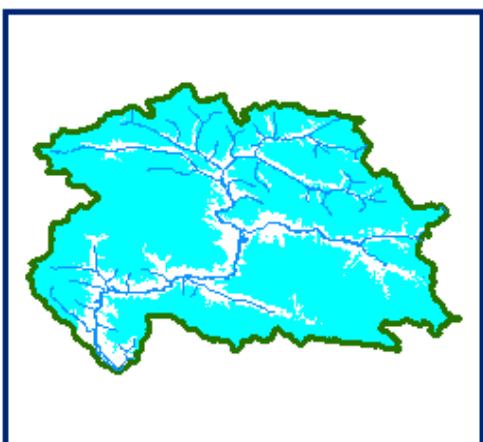
**SNOW**

0 20 40 80 120 160  
 Kilometers

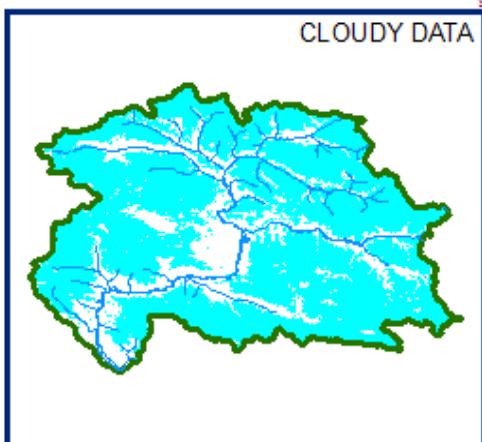
A scale bar at the bottom of the map frame, showing distances from 0 to 160 kilometers in increments of 20. The word "Kilometers" is written below the scale bar.

**SNOW COVER MAP**

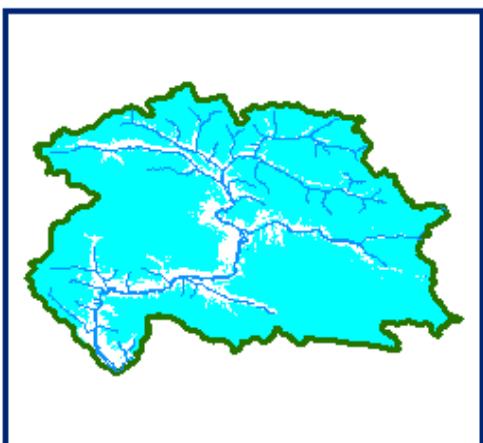
: HANZA BASIN



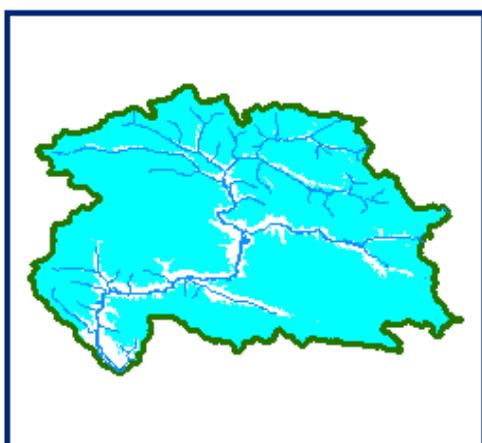
06 MARCH 2014



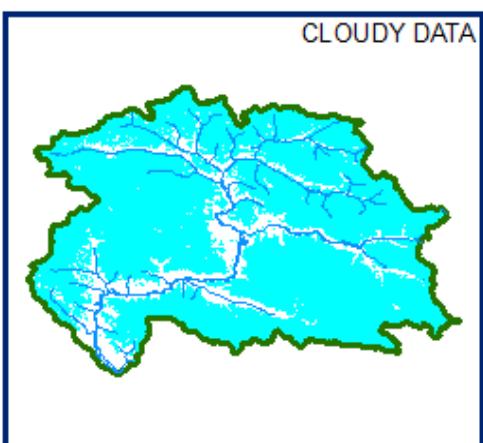
08 MARCH 2014



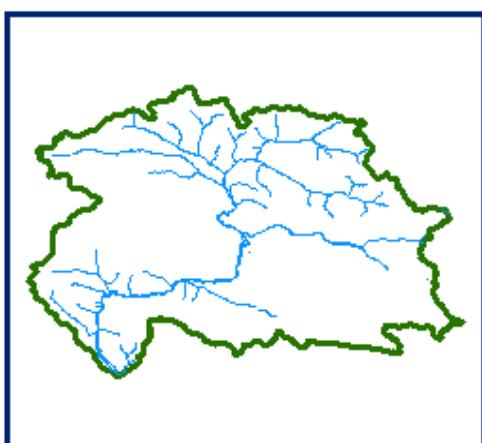
13 MARCH 2014



20 MARCH 2014



23 MARCH 2014

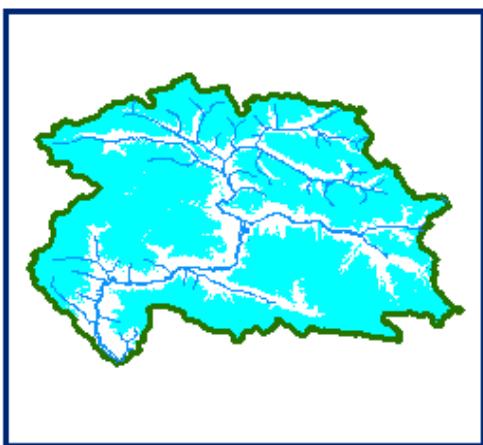


DATA NOT AVAILABLE

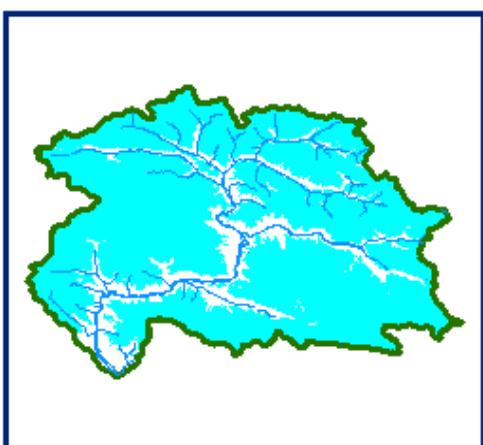


0 20 40 80 120 160  
Kilometers

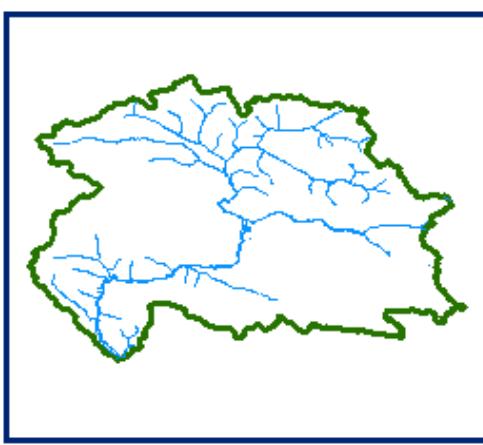
**10 DAILY SNOW COVER MAP: HANZA BASIN**



**DATA USED**  
**10 MARCH 2014**  
**03 MARCH 2014**  
**06 MARCH 2014**



**DATA USED**  
**20 MARCH 2014**  
**13 MARCH 2014**



**DATA USED**  
**DATA NOT AVAILABLE**



**SNOW**

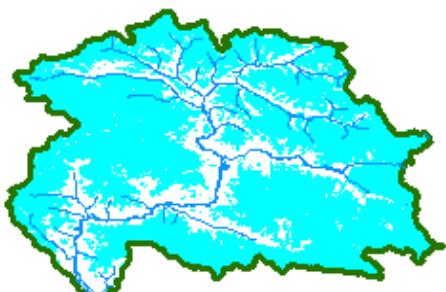
0 20 40 80 120 160  
Kilometers

## SNOW COVER MAP

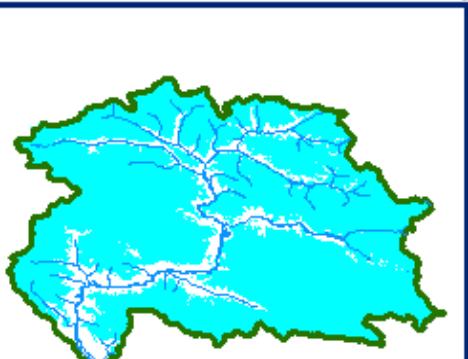
: HANZA BASIN



CLOUDY DATA



03 APRIL 2014



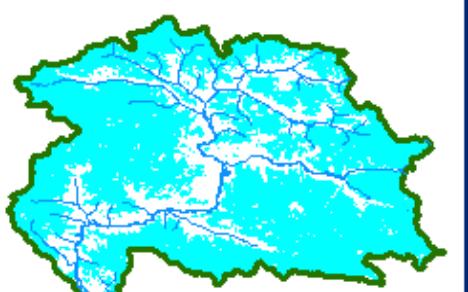
09 APRIL 2014

CLOUDY DATA

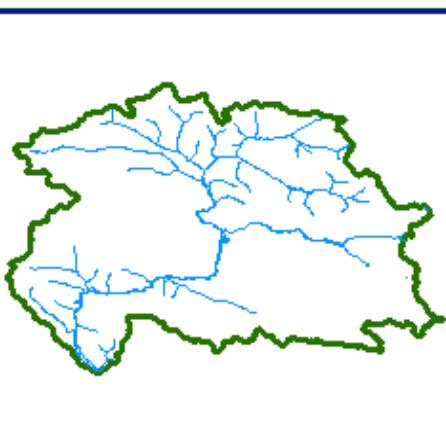


11 APRIL 2014

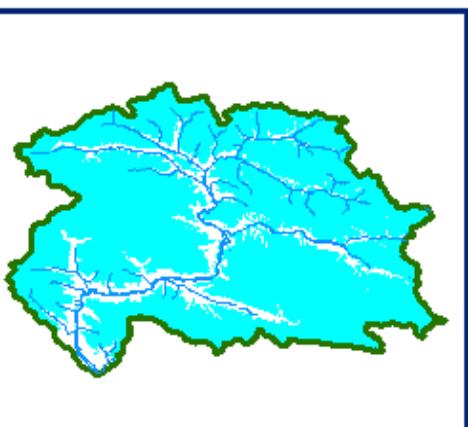
CLOUDY DATA



14 APRIL 2014



DATA NOT AVAILABLE

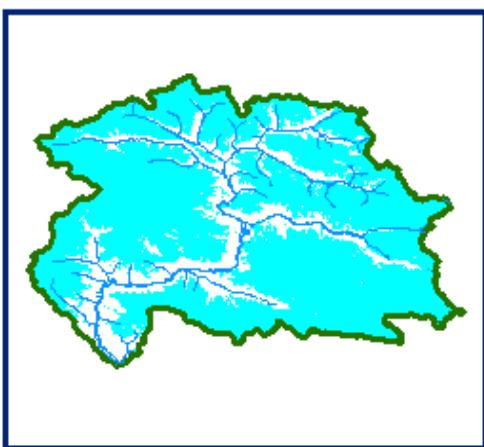


28 APRIL 2014

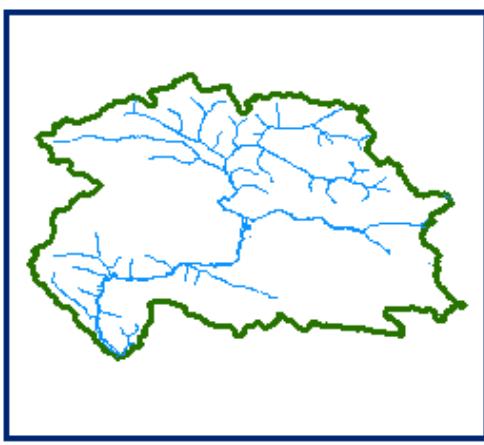
SNOW

0 20 40 80 120 160  
 Kilometers

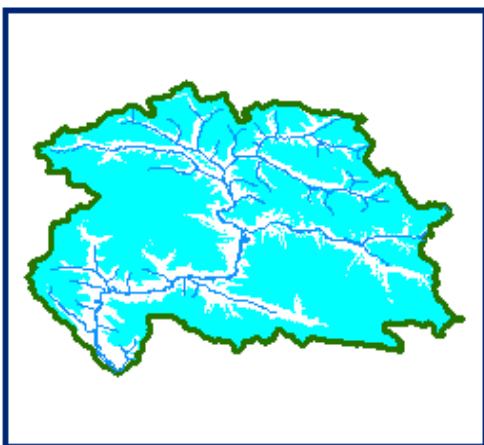
## **10 DAILY SNOW COVER MAP: HANZA BASIN**



**DATA USED  
09 APRIL 2014  
03 APRIL 2014**



**DATA USED  
DATA NOT AVAILABLE**



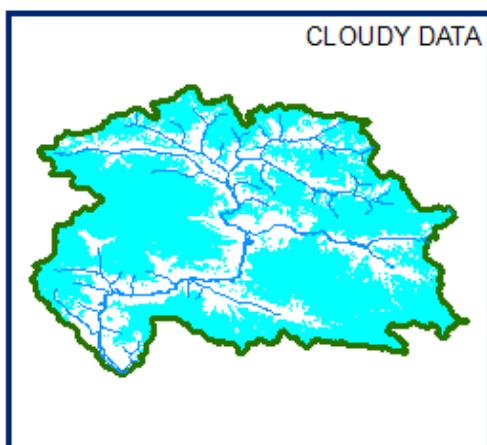
**DATA USED  
28 APRIL 2014  
30 APRIL 2014**



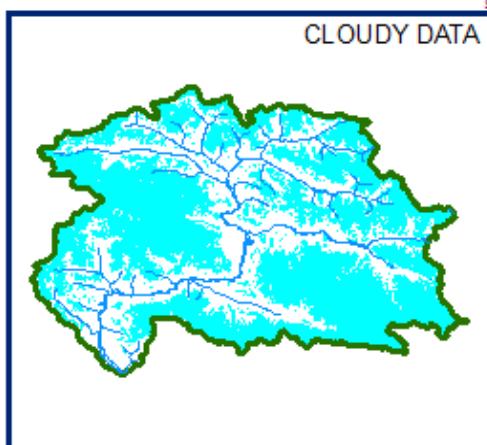
**SNOW**

0 20 40 80 120 160  
 Kilometers

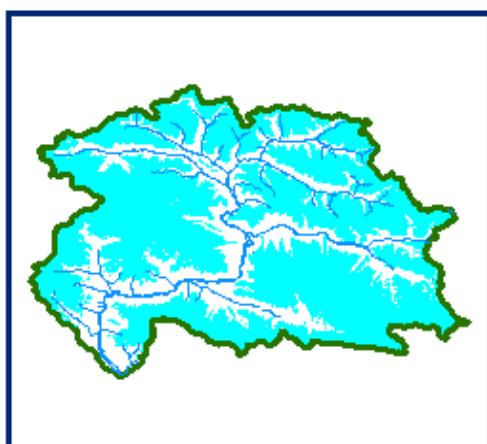
**SNOW COVER MAP : HANZA BASIN**



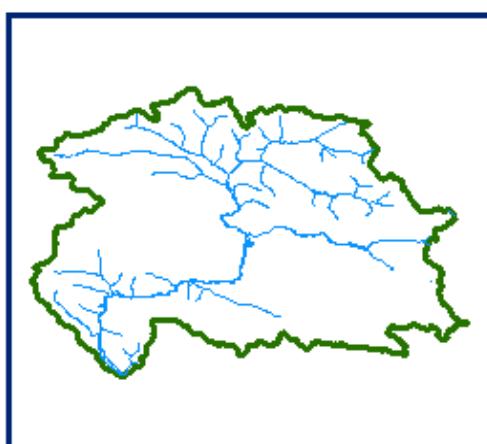
03 MAY 2014



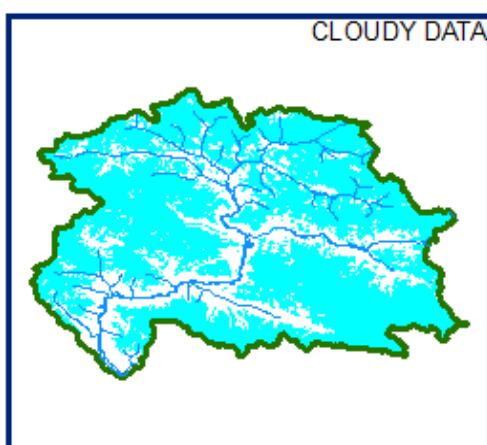
07 MAY 2014



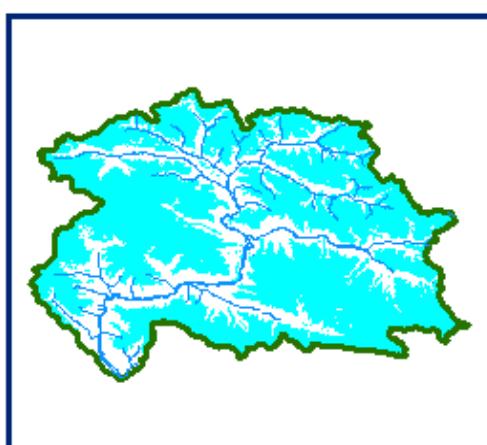
10 MAY 2014



DATA NOT AVAILABLE



24 MAY 2014

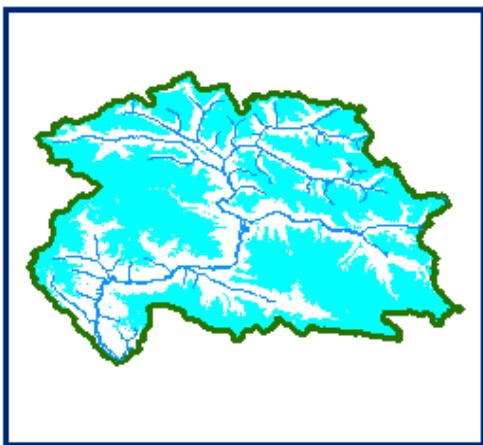


29 MAY 2014

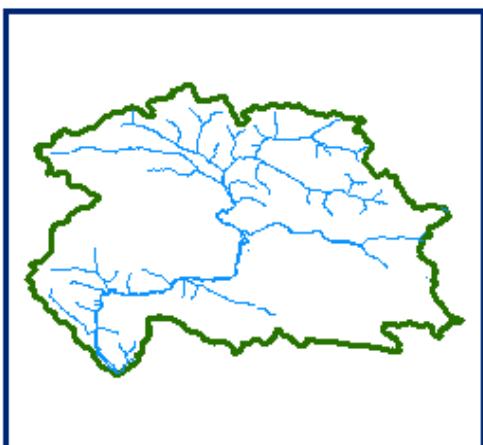
SNOW

0 20 40 80 120 160  
Kilometers

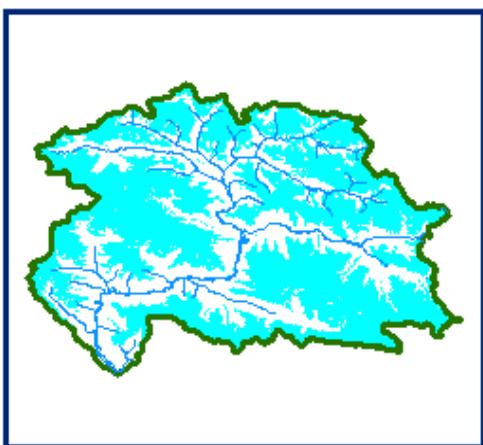
**10 DAILY SNOW COVER MAP: HANZA BASIN**



DATA USED  
**10 MAY 2014**  
**07 MAY 2014**  
**03 MAY 2014**



DATA USED  
**DATA NOT AVAILABLE**



DATA USED  
**29 MAY 2014**  
**24 MAY 2014**  
**27 MAY 2014**

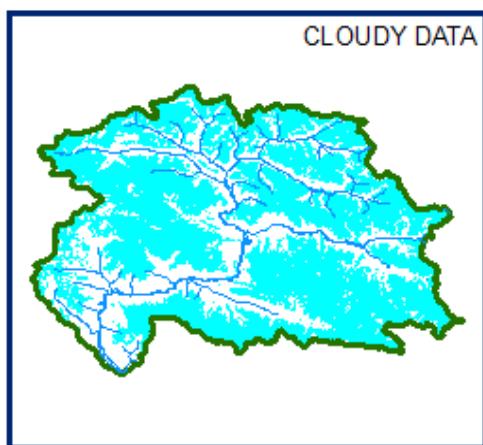


0 20 40 80 120 160  
Kilometers

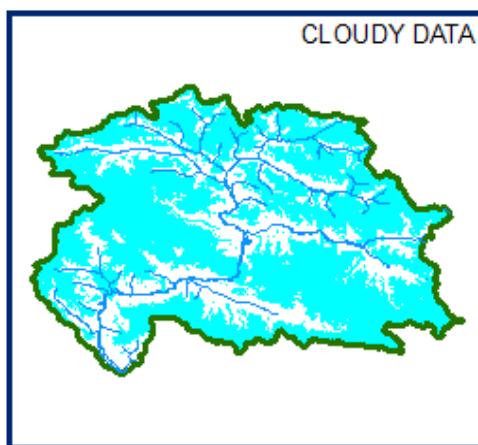
A scale bar at the bottom left indicating distances from 0 to 160 kilometers, with intermediate markers at 20, 40, and 80 km. Below the numbers is the word "Kilometers".

## SNOW COVER MAP

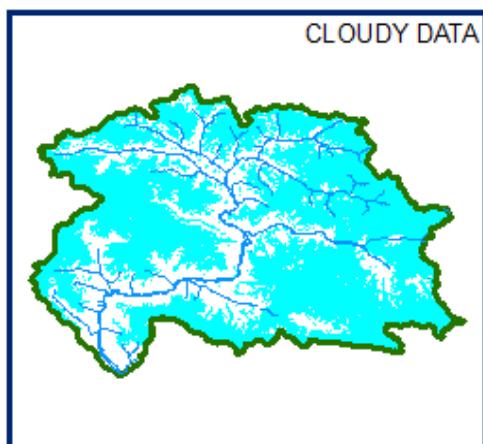
: HANZA BASIN



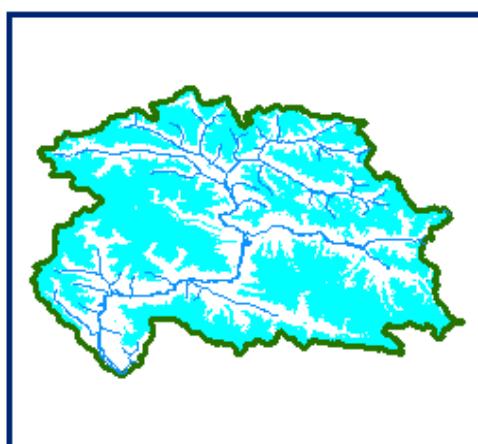
03 JUNE 2014



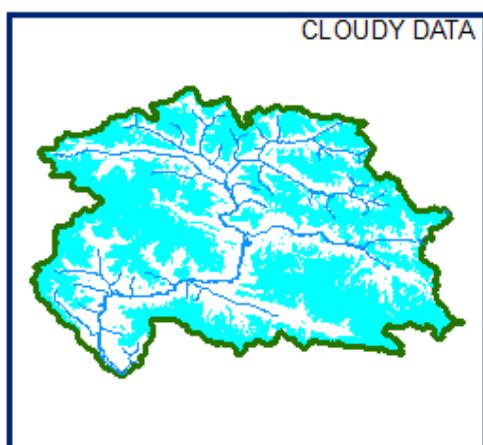
10 JUNE 2014



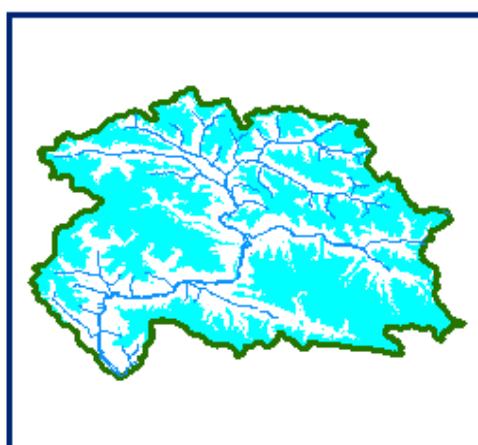
12 JUNE 2014



14 JUNE 2014



24 JUNE 2014

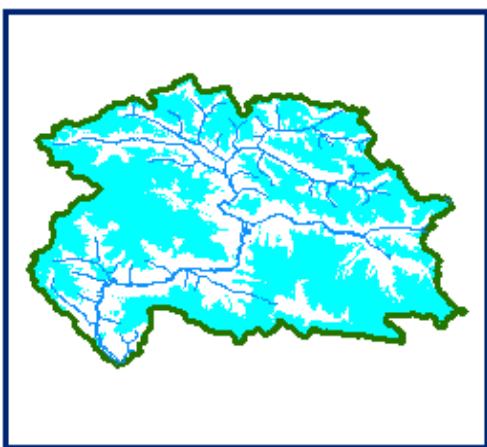
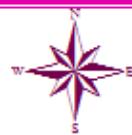


27 JUNE 2014

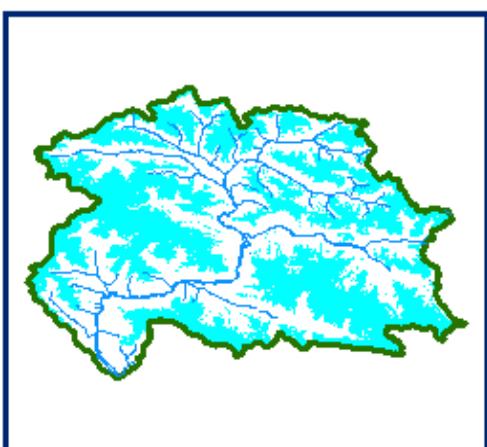
SNOW

0 20 40 80 120 160  
Kilometers

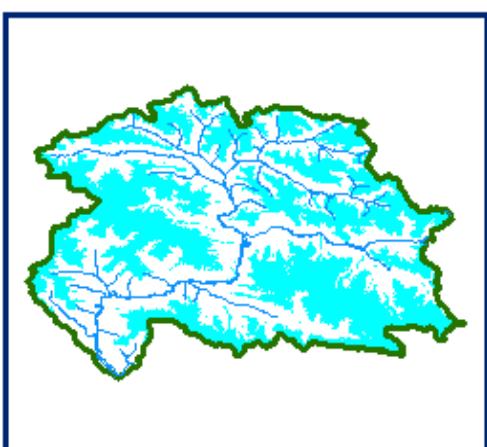
**10 DAILY SNOW COVER MAP: HANZA BASIN**



DATA USED  
**05 JUNE 2014**  
**10 JUNE 2014**  
**03 JUNE 2014**



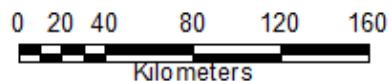
DATA USED  
**14 JUNE 2014**  
**12 JUNE 2014**



DATA USED  
**27 JUNE 2014**  
**24 JUNE 2014**  
**26 JUNE 2014**



SNOW



### AREAL EXTENT OF SNOW (5 DAILY)

**BASIN NAME: GILGIT**

**BASIN AREA: 13615 sq km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S.No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>							
1	03-Oct-13	910	7	7	15-Oct-13	2535	19
2	05-Oct-13	1227	9	8	18-Oct-13	4026	30
3	06-Oct-13	1055	8	9	20-Oct-13	3045	22
4	08-Oct-13	866	6	10	22-Oct-13	1921	14
5	10-Oct-13	2621	19	11	23-Oct-13	3180	23
6	11-Oct-13	3217	24	12	25-Oct-13	2432	18
<b>November 2013</b>							
13	01-Nov-13	7602	56	17	20-Nov-13	8834	65
14	10-Nov-13	9629	71	18	25-Nov-13	7166	53
15	13-Nov-13	9024	66	19	30-Nov-13	7961	58
16	15-Nov-13	9610	71				
<b>December 2013</b>							
20	04-Dec-13	4453	33	23	14-Dec-013	8819	65
21	10-Dec-13	5088	37	24	26-Dec-13	9202	68
22	12-Dec-013	10657	78				
<b>January 2014</b>							
25	02-Jan-14	10465	77	29	26-Jan-14	9170	67
26	07-Jan-14	10234	75	30	27-Jan-14	10543	78
27	17-Jan-14	10691	78	31	29-Jan-14	10875	80
28	24-Jan-14	7055	52	32	31-Jan-14	7462	55
<b>February 2014</b>							
33	10-Feb-14	10745	79	36	15-Feb-14	10219	75
34	12-Feb-14	10222	75	37	17-Feb-14	10918	80
35	14-Feb-14	9937	73				
<b>March 2014</b>							
38	06-Mar-14	10037	74	41	20-Mar-14	11512	85
39	08-Mar-14	8831	65	42	22-Mar-14	9354	69
40	13-Mar-14	10618	78	43	23-Mar-14	9012	66
<b>April 2014</b>							
44	03-Apr-14	9276	68	48	28-Apr-14	9803	72
45	09-Apr-14	10042	74	49	30-Apr-14	5174	38
46	11-Apr-14	11927	88				
47	13-Apr-14	10213	75				

<b>May 2014</b>							
50	07-May-14	6026	44	53	24-May-14	6808	50
51	09-May-14	7358	54	55	26-May-14	6851	50
52	10-May-14	7573	56	56	29-May-14	7067	52
<b>June 2014</b>							
57	03-Jun-14	4793	35	61	14-Jun-14	6322	46
58	05-Jun-14	7156	53	62	24-Jun-14	4762	35
59	10-Jun-14	6102	45	63	26-Jun-14	4302	32
60	12-Jun-14	5123	38				

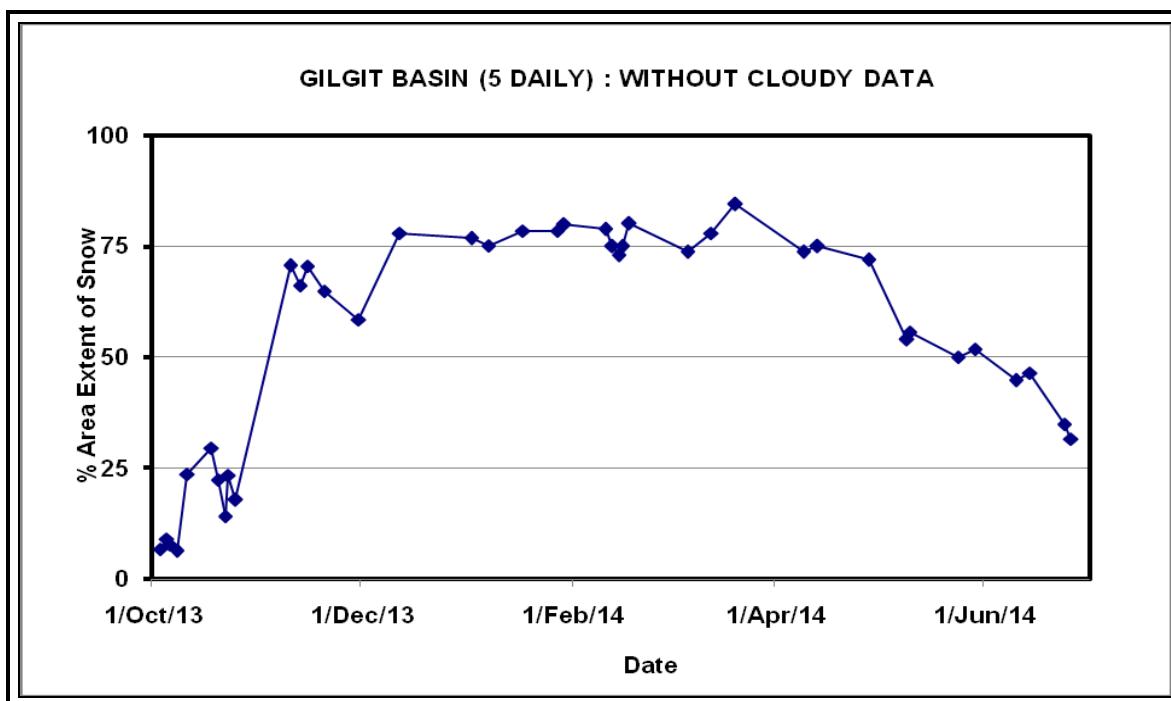
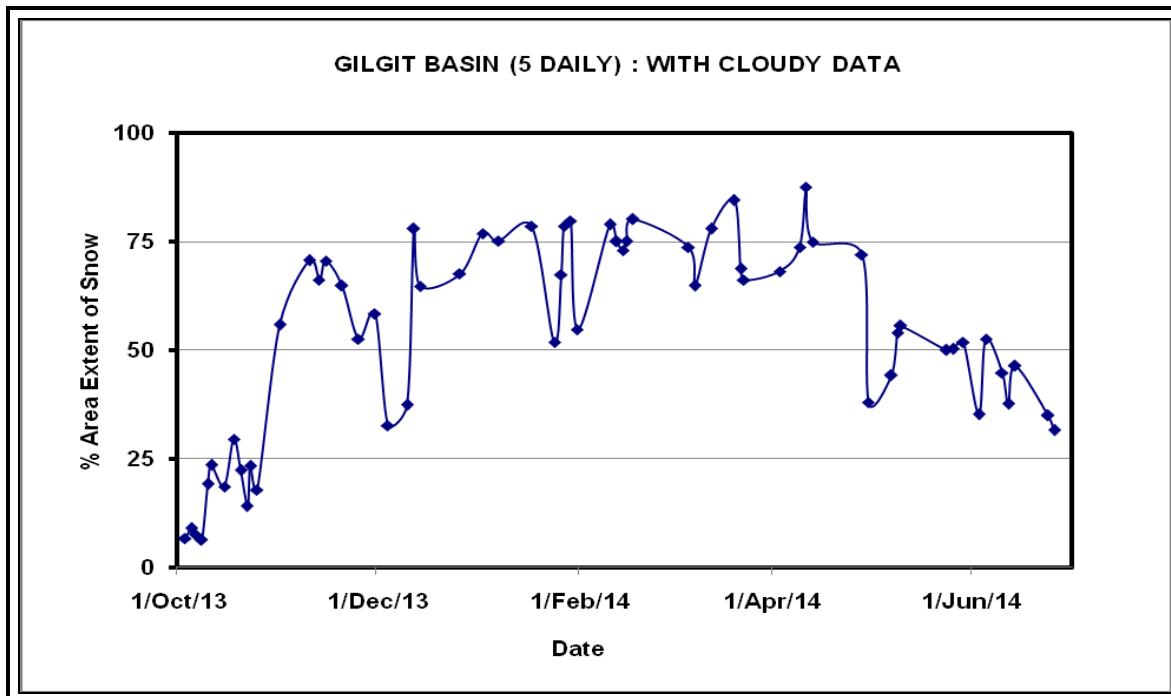
**AREAL EXTENT OF SNOW (10 DAILY)**

**BASIN NAME: GILGIT**

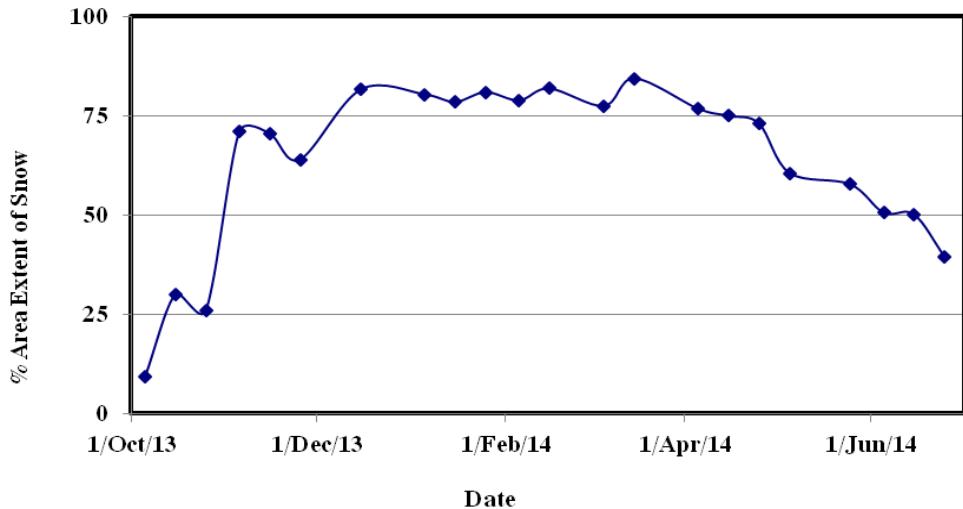
**BASIN AREA: 13615 sq km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>				<b>November 2013</b>			
1	5-Oct-13	1253	9	4	5-Nov-13	9629	71
2	15-Oct-13	4026	30	5	15-Nov-13	9610	71
3	25-Oct-04	3180	23	6	25-Nov-04	8719	64
<b>December 2013</b>				<b>January 2014</b>			
7	15-Dec-13	11121	82	8	5-Jan-14	10950	80
				9	15-Jan-14	10691	79
				10	25-Jan-14	11026	81
<b>February 2014</b>				<b>March 2014</b>			
11	5-Feb-14	10745	79	13	5-Mar-14	10554	78
12	15-Feb-14	11154	82	14	15-Mar-14	11501	84
<b>April 2014</b>				<b>May 2014</b>			
15	5-Apr-14	10455	77	18	5-May-14	8253	61
16	15-Apr-14	10213	75	19	25-May-14	7864	58
17	25-Apr-14	9948	73				
<b>June 2014</b>							
20	5-Jun-14	6886	51				
21	15-Jun-14	6830	50				
22	25-Jun-14	5384	40				

### Snow cover depletion curve

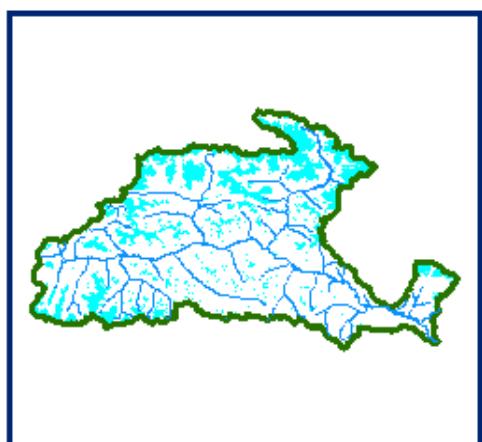


GILGIT BASIN (10 DAILY)

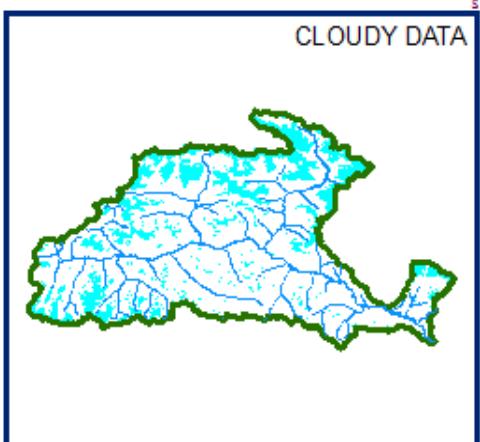


# *SNOW COVER MAP*

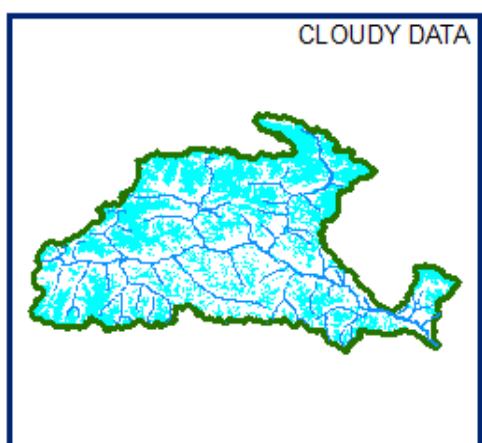
**SNOW COVER MAP : GILGIT BASIN**



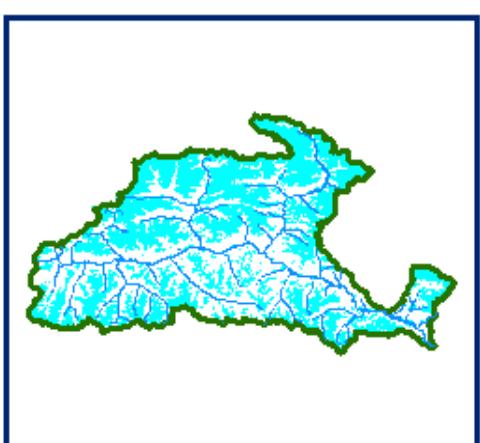
**03 OCTOBER 2013**



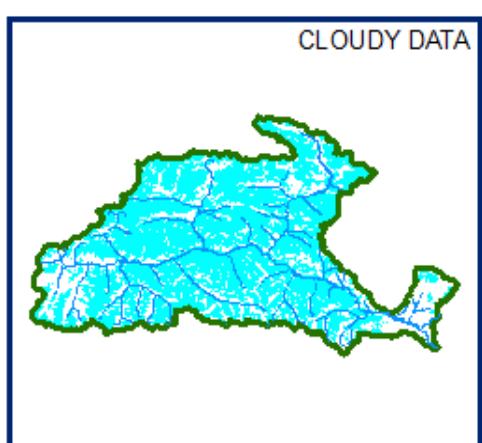
**08 OCTOBER 2013**



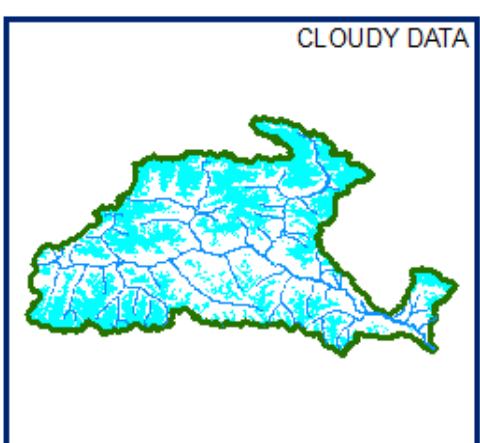
**15 OCTOBER 2013**



**20 OCTOBER 2013**



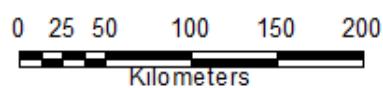
**23 OCTOBER 2013**



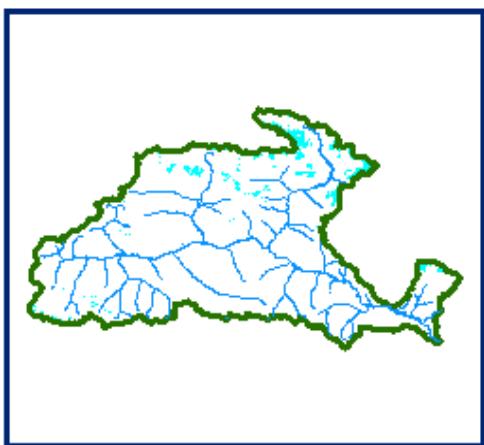
**25 OCTOBER 2013**



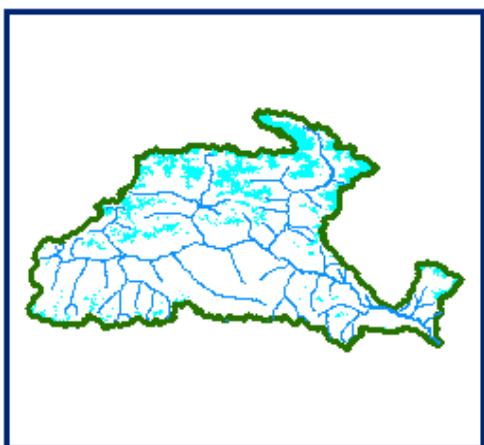
**SNOW**



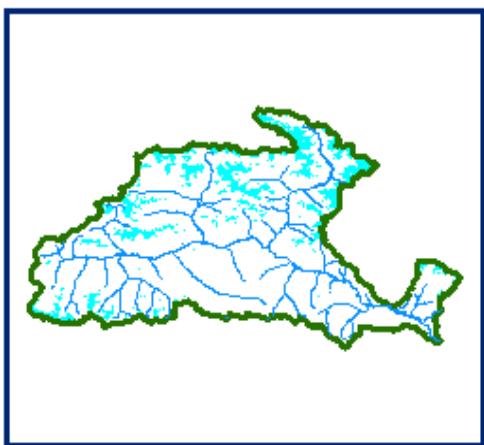
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



**DATA USED**  
**03 OCTOBER 2013**  
**10 OCTOBER 2013**  
**08 OCTOBER 2013**



**DATA USED**  
**20 OCTOBER 2013**  
**15 OCTOBER 2013**  
**18 OCTOBER 2013**



**DATA USED**  
**25 OCTOBER 2013**  
**23 OCTOBER 2013**

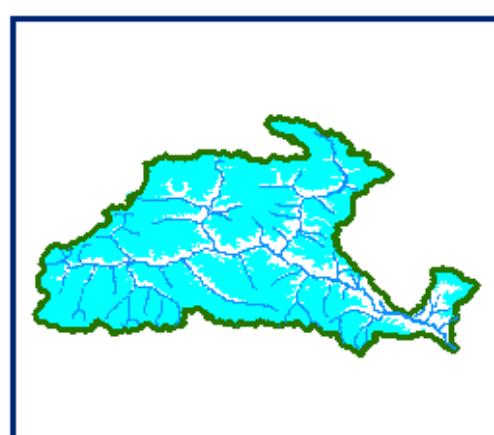
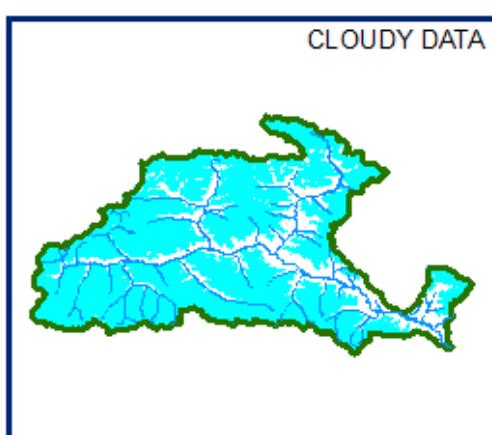
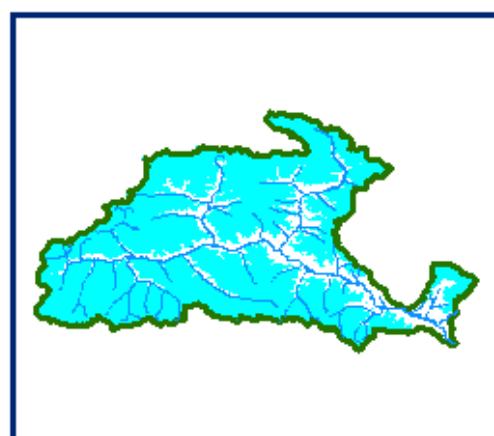
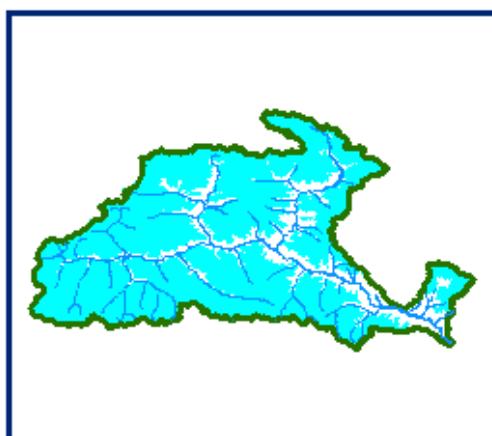
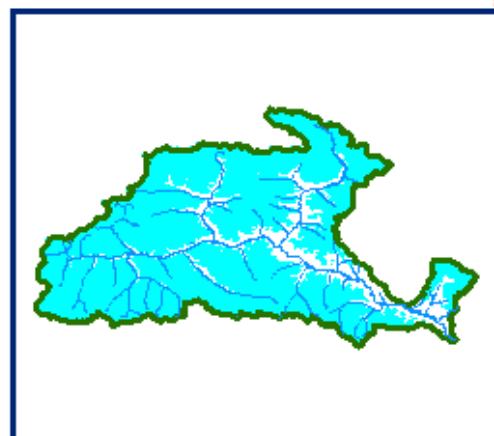
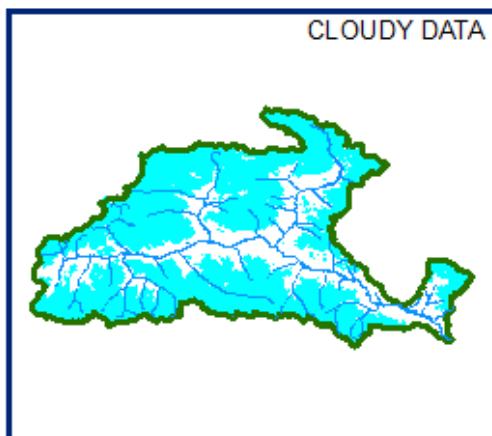


**SNOW**

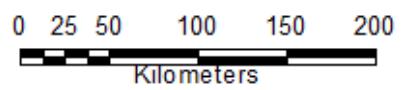
0 25 50 100 150 200  
Kilometers

A scale bar at the bottom of the map frame, showing distances from 0 to 200 kilometers. The word "Kilometers" is written below the scale bar.

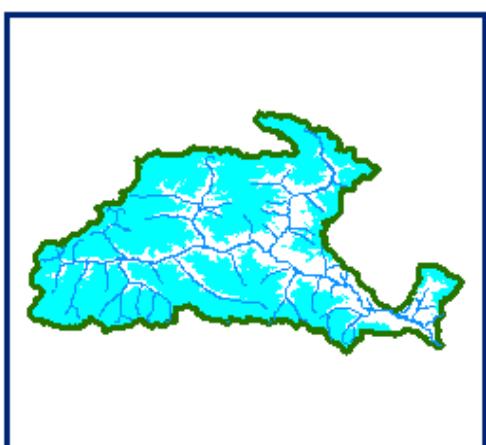
**SNOW COVER MAP : GILGIT BASIN**



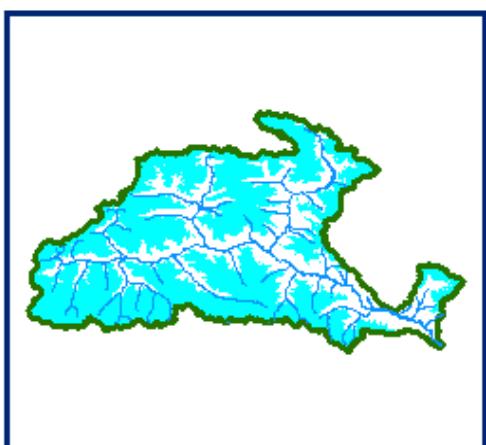
SNOW



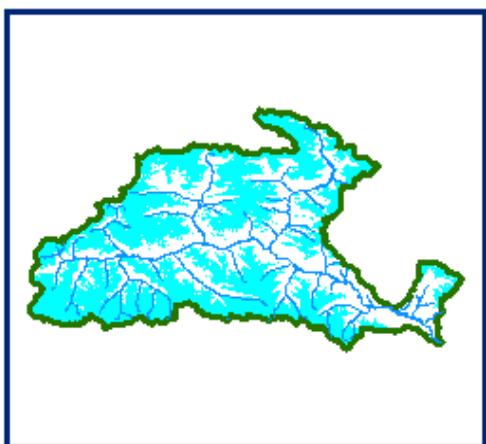
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



**DATA USED**  
**10 NOVEMBER 2013**  
**01 NOVEMBER 2013**



**DATA USED**  
**15 NOVEMBER 2013**  
**13 NOVEMBER 2013**  
**20 NOVEMBER 2013**



**DATA USED**  
**30 NOVEMBER 2013**  
**25 NOVEMBER 2013**

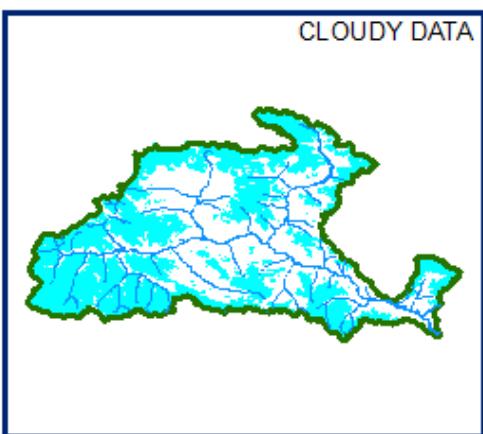


0 25 50 100 150 200  
Kilometers

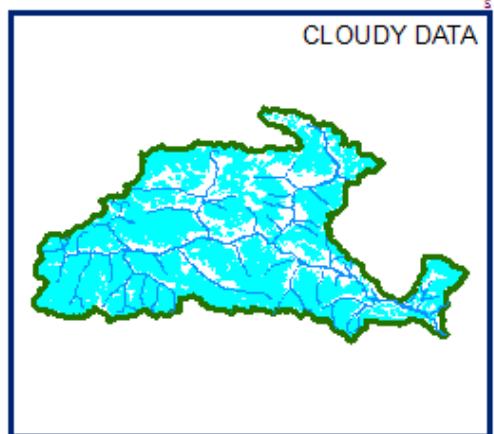
A scale bar at the bottom of the page, consisting of a horizontal line with tick marks at 25-unit intervals from 0 to 200, followed by the text "Kilometers".

## SNOW COVER MAP

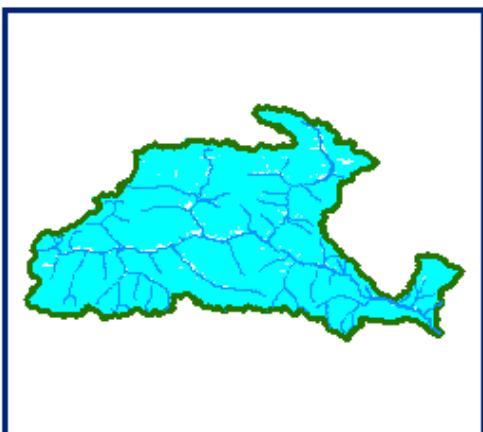
: GILGIT BASIN



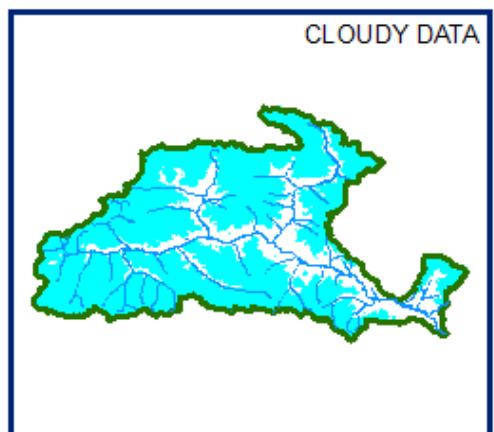
04 DECEMBER 2013



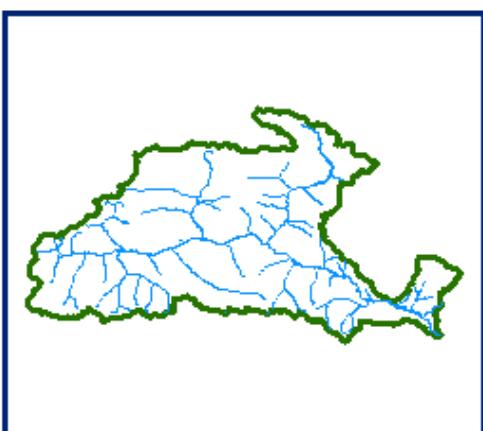
10 DECEMBER 2013



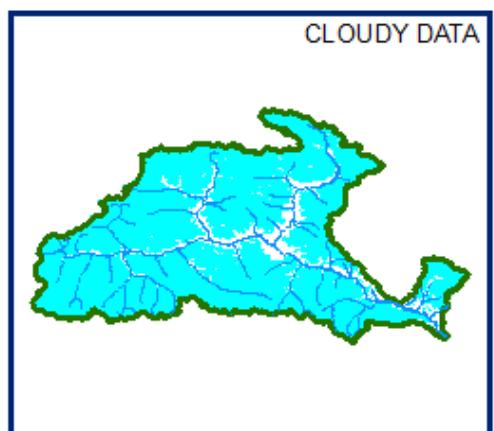
12 DECEMBER 2013



14 DECEMBER 2013



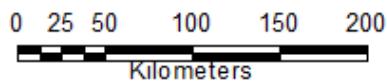
DATA NOT AVAILABLE



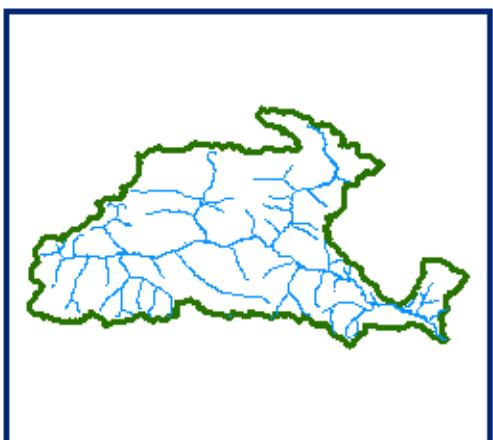
26 DECEMBER 2013



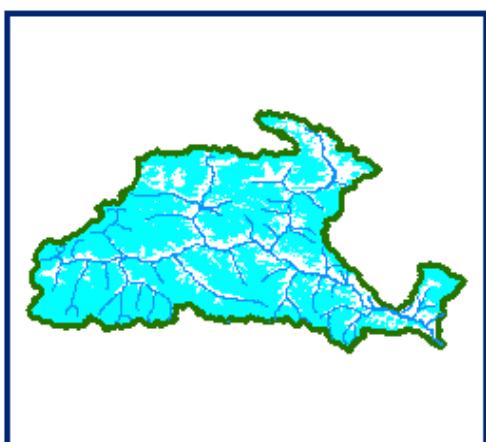
SNOW



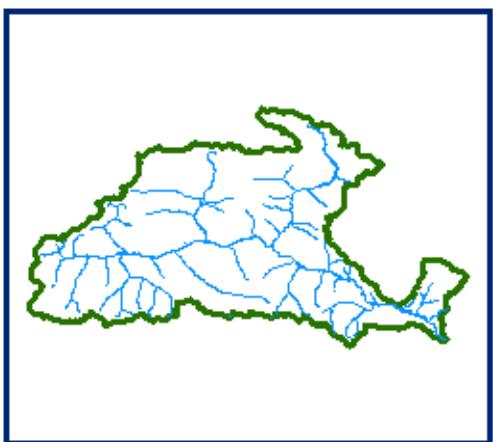
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



**DATA USED  
DATA NOT AVAILABLE**



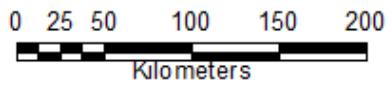
**DATA USED  
12 DECEMBER 2013  
14 DECEMBER 2013**



**DATA USED  
DATA NOT AVAILABLE**

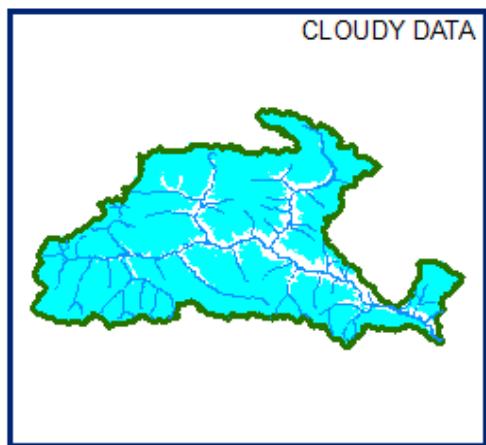


**SNOW**

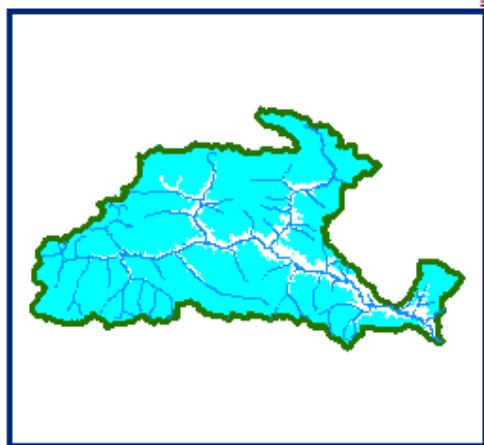


## SNOW COVER MAP

: GILGIT BASIN



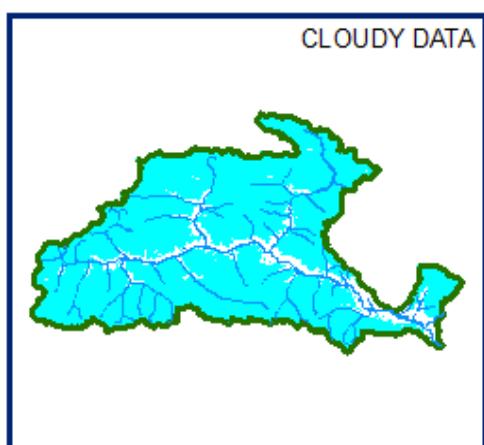
02 JANUARY 2014



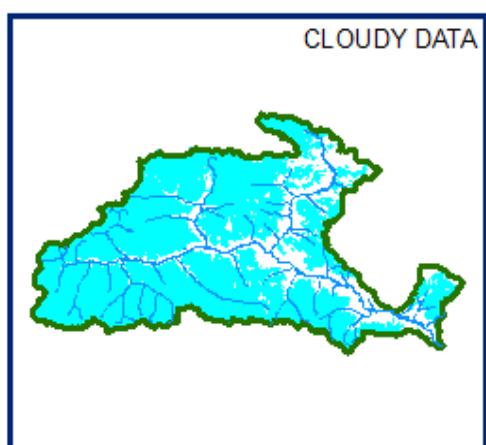
07 JANUARY 2014



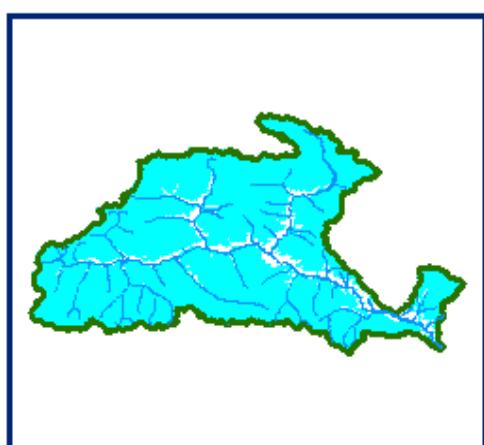
DATA NOT AVAILABLE



17 JANUARY 2014



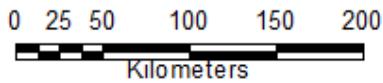
24 JANUARY 2014



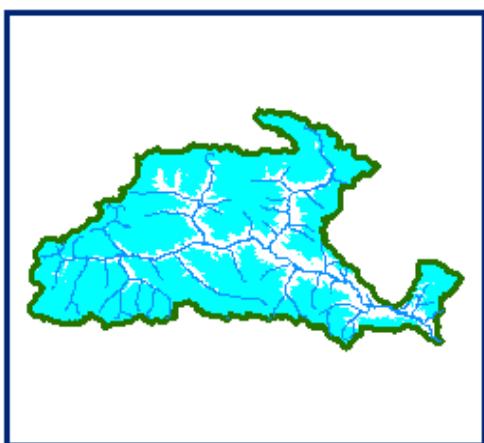
29 JANUARY 2014



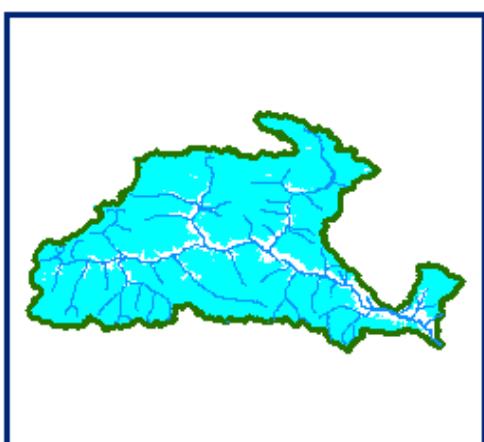
SNOW



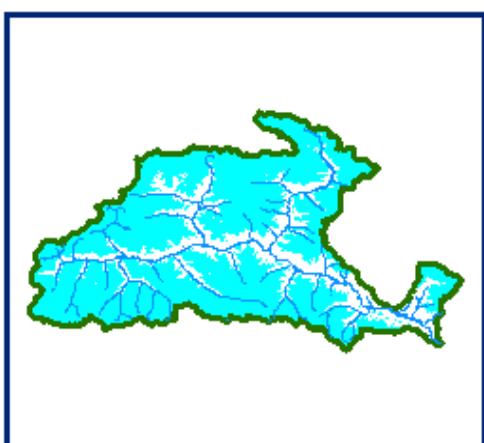
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



**DATA USED  
02 JANUARY 2014  
07 JANUARY 2014**



**DATA USED  
17 JANUARY 2014**



**DATA USED  
29 JANUARY 2014  
31 JANUARY 2014  
26 JANUARY 2014**



**SNOW**

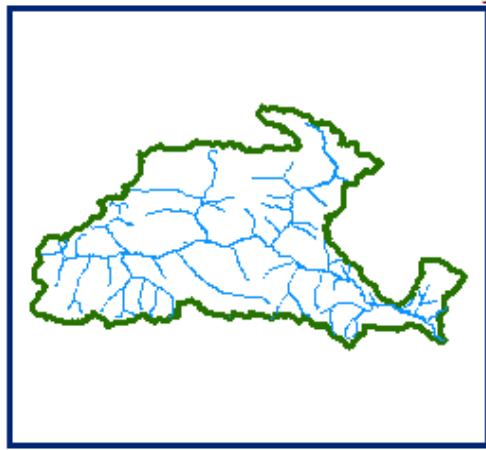
0 25 50 100 150 200  
Kilometers

**SNOW COVER MAP**

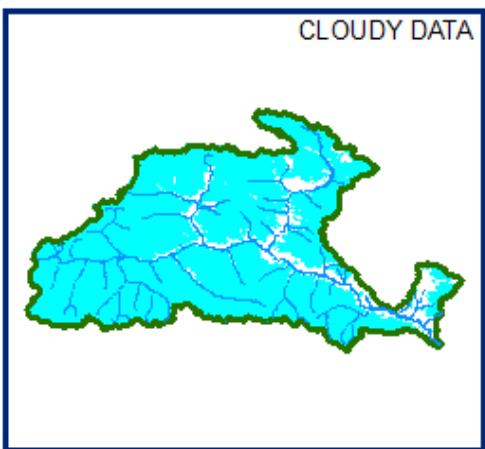
: **GILGIT BASIN**



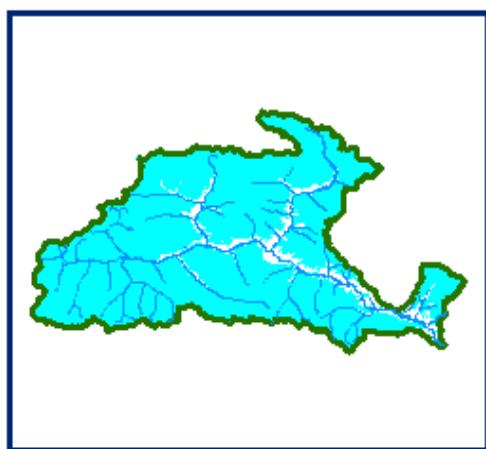
**DATA NOT AVAILABLE**



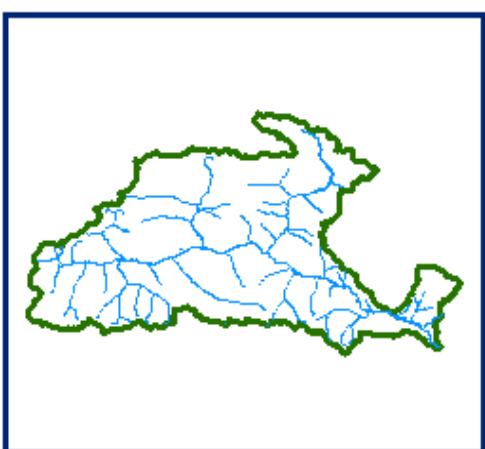
**DATA NOT AVAILABLE**



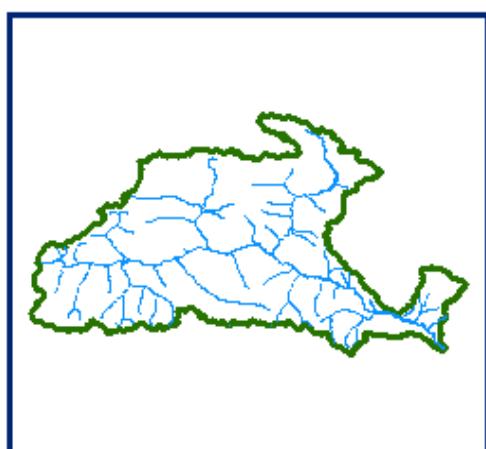
**CLOUDY DATA**  
**12 FEBRUARY 2014**



**17 FEBRUARY 2014**



**DATA NOT AVAILABLE**



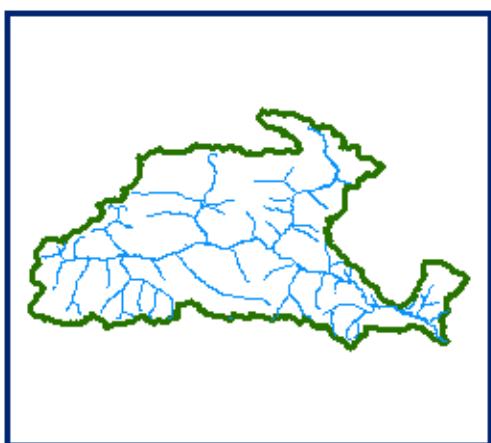
**DATA NOT AVAILABLE**



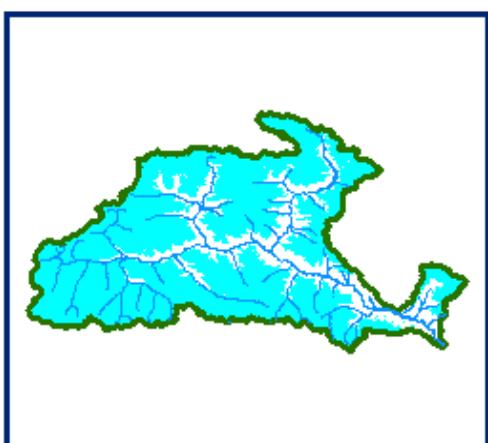
**SNOW**

0 25 50 100 150 200  
Kilometers

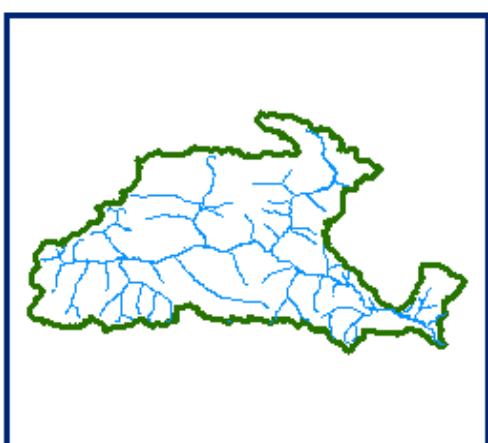
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
17 FEBRUARY 2014  
14 FEBRUARY 2014  
15 FEBRUARY 2014**



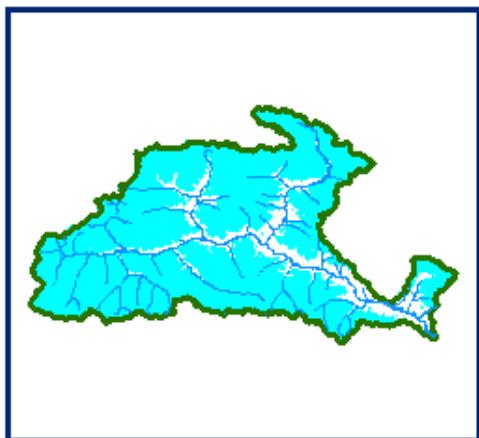
**DATA USED  
DATA NOT AVAILABLE**



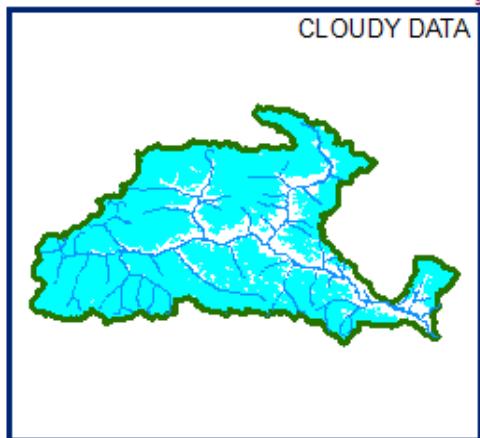
**SNOW**

0 25 50 100 150 200  
  
Kilometers

**SNOW COVER MAP : GILGIT BASIN**



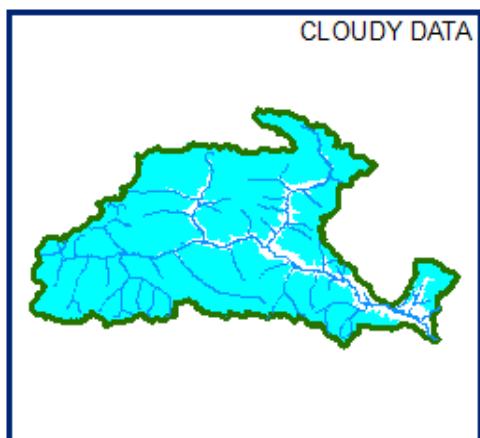
**06 MARCH 2014**



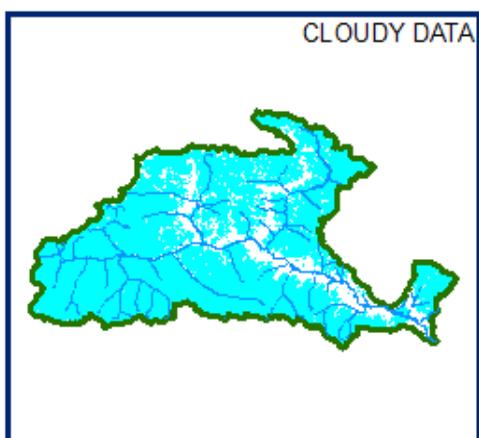
**08 MARCH 2014**



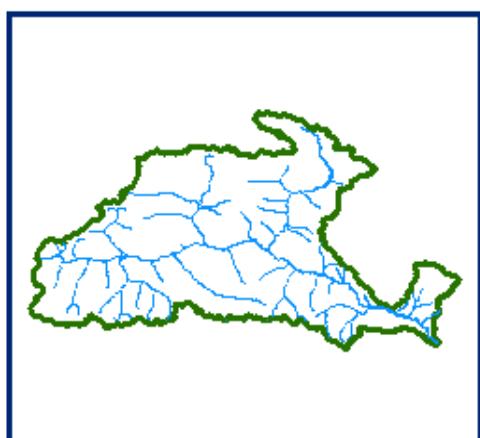
**13 MARCH 2014**



**20 MARCH 2014**



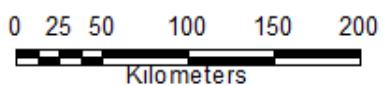
**22 MARCH 2014**



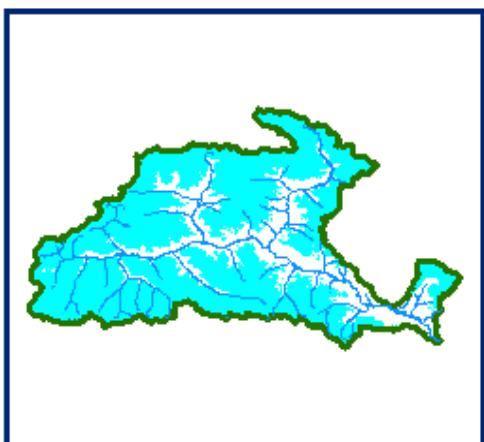
**DATA NOT AVAILABLE**



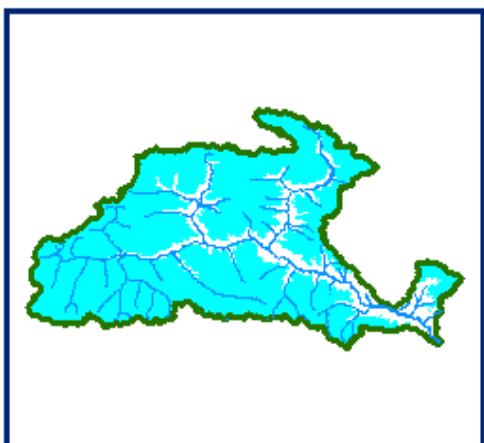
**SNOW**



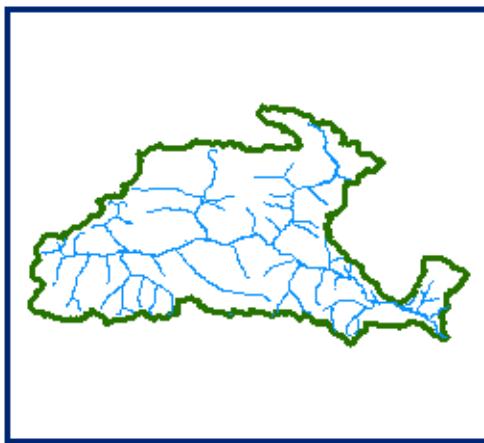
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



**DATA USED  
06 MARCH 2014**



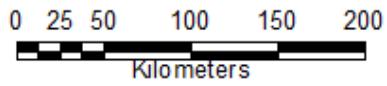
**DATA USED  
13 MARCH 2014  
20 MARCH 2014**



**DATA USED  
DATA NOT AVAILABLE**



**SNOW**



**SNOW COVER MAP**

: **GILGIT BASIN**



CLOUDY DATA



03 APRIL 2014



09 APRIL 2014

CLOUDY DATA



13 APRIL 2014



DATA NOT AVAILABLE

DATA NOT AVAILABLE

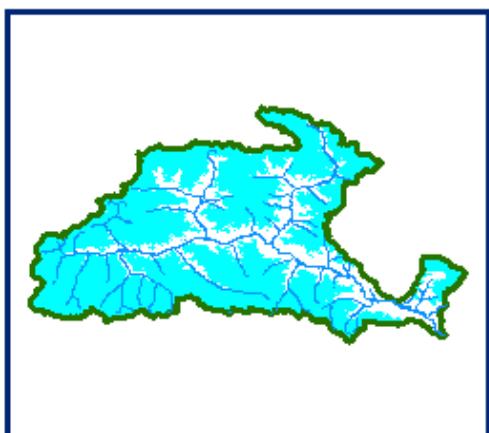
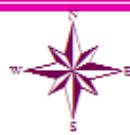
28 APRIL 2014



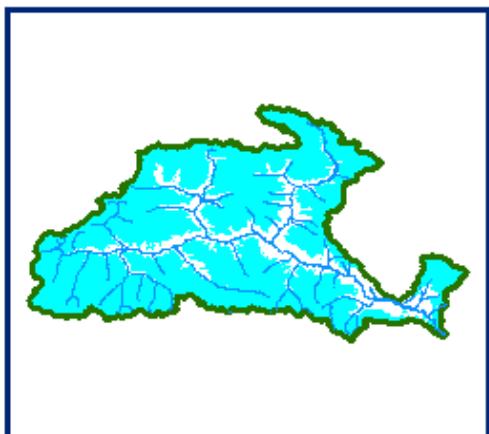
SNOW

0 25 50 100 150 200  
Kilometers

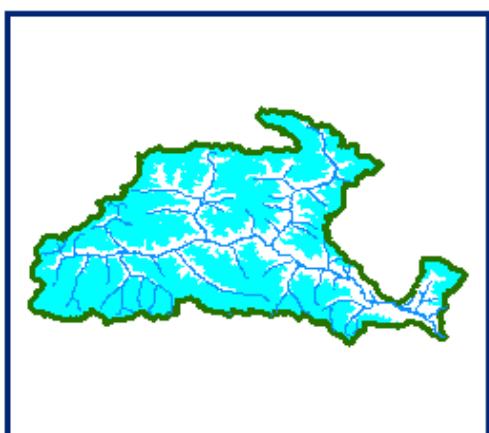
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



DATA USED  
**09 APRIL 2014**  
**03 APRIL 2014**



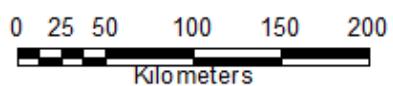
DATA USED  
**13 APRIL 2014**  
**11 APRIL 2014**



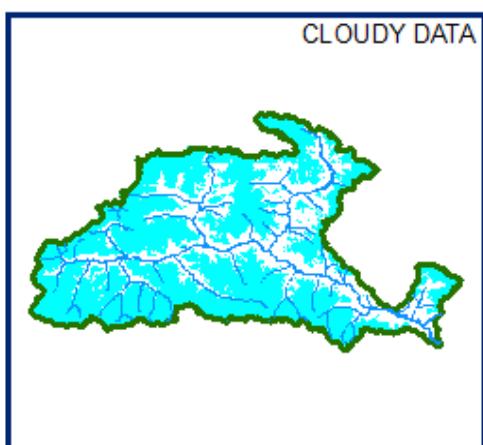
DATA USED  
**28 APRIL 2014**  
**30 APRIL 2014**



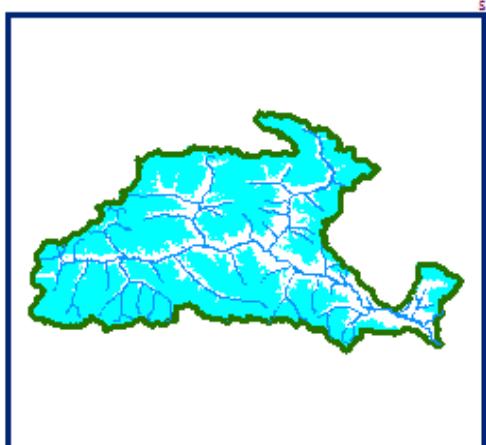
**SNOW**



**SNOW COVER MAP : GILGIT BASIN**



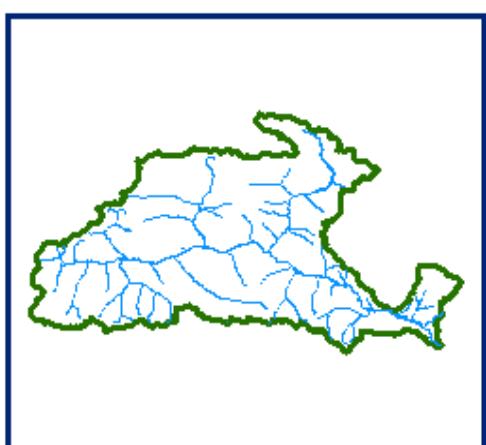
07 MAY 2014



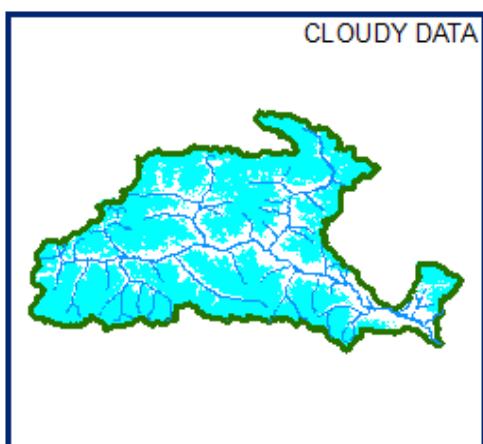
10 MAY 2014



DATA NOT AVAILABLE



DATA NOT AVAILABLE



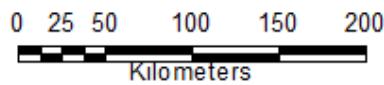
24 MAY 2014



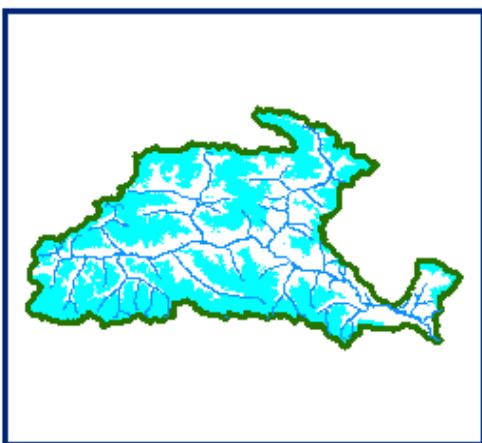
29 MAY 2014



SNOW



**10 DAILY SNOW COVER MAP: GILGIT BASIN**



DATA USED

**10 MAY 2014**

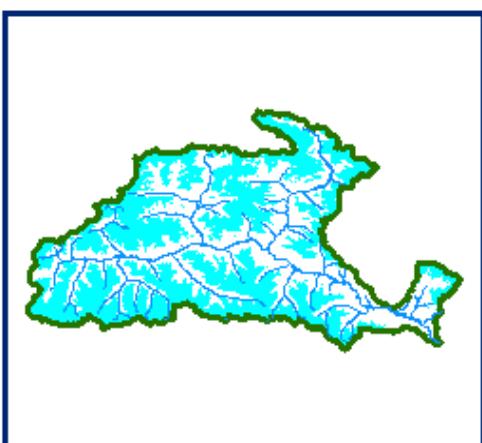
**03 MAY 2014**

**09 MAY 2014**



DATA USED

**DATA NOT AVAILABLE**



DATA USED

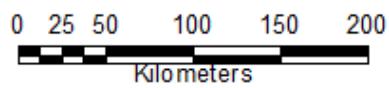
**29 MAY 2014**

**26 MAY 2014**

**24 MAY 2014**

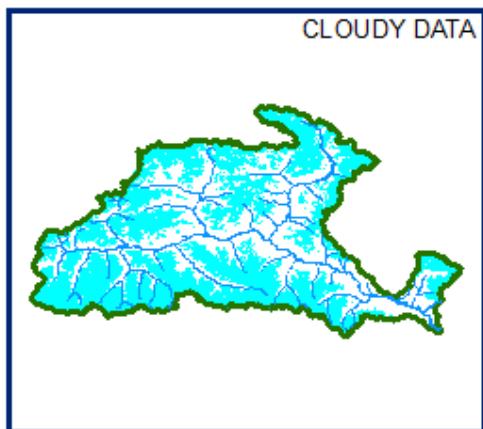


SNOW

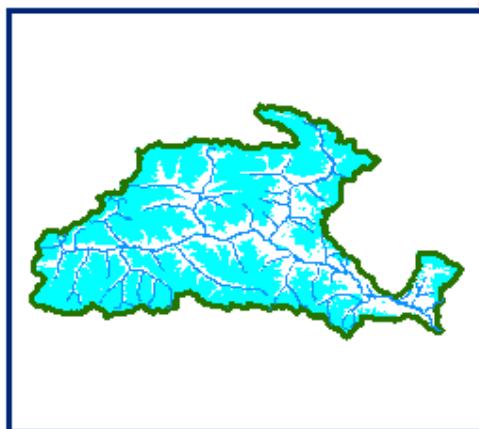


**SNOW COVER MAP**

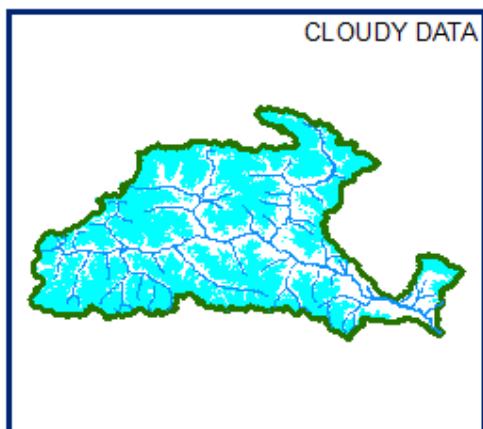
: GILGIT BASIN



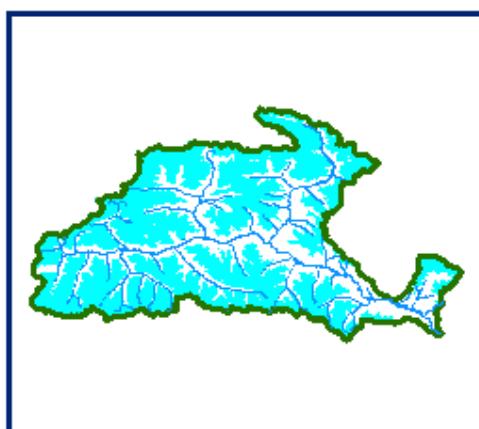
03 JUNE 2014



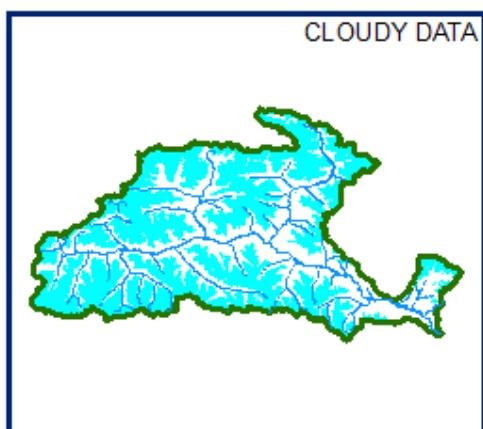
10 JUNE 2014



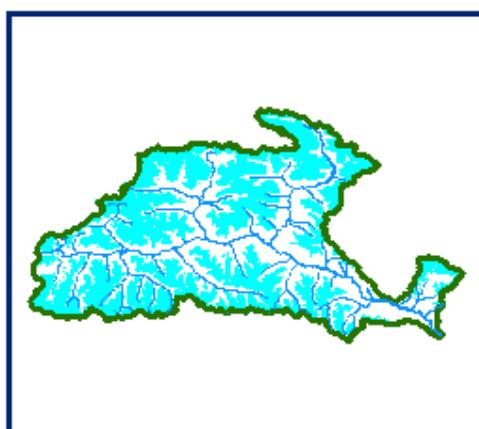
12 JUNE 2014



14 JUNE 2014



24 JUNE 2014

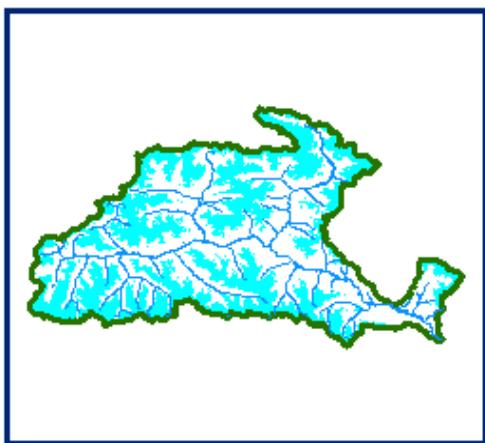


26 JUNE 2014

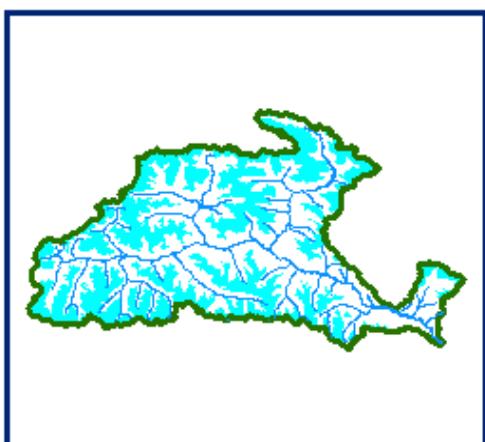
SNOW

0 25 50 100 150 200  
Kilometers

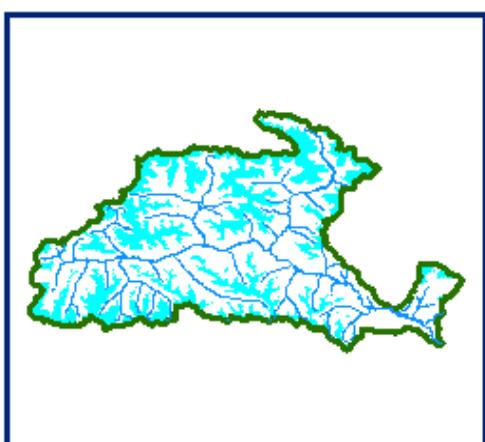
**10 DAILY SNOW COVER MAP: GILGIT BASIN**



DATA USED  
**10 JUNE 2014**  
**03 JUNE 2014**  
**05 JUNE 2014**



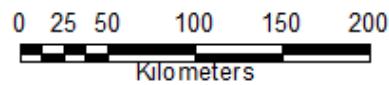
DATA USED  
**14 JUNE 2014**  
**12 JUNE 2014**



DATA USED  
**24 JUNE 2014**  
**26 JUNE 2014**



SNOW



### AREAL EXTENT OF SNOW (5 DAILY)

**BASIN NAME: SHASGAN**

**BASIN AREA: 7613 sq km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>							
1	03-Oct-13	2682	35	8	16-Oct-13	3646	48
2	04-Oct-13	2538	33	9	18-Oct-13	3191	42
3	06-Oct-13	2827	37	10	20-Oct-13	3597	47
4	08-Oct-13	2522	33	11	21-Oct-13	3554	47
5	09-Oct-13	2648	35	12	23-Oct-13	3056	40
6	10-Oct-13	3578	47	13	25-Oct-13	3285	43
7	11-Oct-13	2663	35	14	28-Oct-13	3056	40
<b>November 2013</b>							
15	01-Nov-13	3271	43	20	21-Nov-13	2765	36
16	13-Nov-13	2596	34	21	25-Nov-13	1201	15
17	15-Nov-13	2985	39	22	26-Nov-13	2834	37
18	16-Nov-13	3211	42	23	30-Nov-13	2697	35
19	20-Nov-13	2908	38				
<b>December 2013</b>							
24	10-Dec-13	2216	29	27	20-Dec-13	4218	55
25	14-Dec-13	2646	34	28	27-Dec-13	3294	43
26	15-Dec-13	2418	32				
<b>January 2014</b>							
29	02-Jan-14	3227	42	34	19-Jan-14	3878	51
30	03-Jan-14	2016	26	35	27-Jan-14	4154	55
31	07-Jan-14	2709	35	36	24-Jan-14	852	11
32	15-Jan-14	4906	64	37	29-Jan-14	4213	55
33	17-Jan-14	2050	27	38	31-Jan-14	3736	49
<b>February 2014</b>							
39	10-Feb-14	2582	34	41	17-Feb-14	3943	52
40	15-Feb-14	2293	30				
<b>March 2014</b>							
42	06-Mar-14	4195	55	44	20-Mar-14	5670	74
43	08-Mar-14	6283	83	45	21-Mar-14	5368	71
	13-Mar-14	6194	81	46	23-Mar-14	5402	71
<b>April 2014</b>							
47	09-Apr-14	5606	74	49	11-Apr-14	3711	49
48	14-Apr-14	4178	55	50	28-Apr-14	5187	68

51	30-Apr-14	4281	57					
<b>May 2014</b>								
52	03-May-14	3983	52.31	55	24-May-14	4666		61
53	08-May-14	3524	46.29	56	27-May-14	4287		56
54	10-May-14	4147	54.47	57	29-May-14	4236		56
<b>June 2014</b>								
58	03-Jun-14	4067	53	62	25-Jun-14	4050.		53
59	05-Jun-14	4051	53	63	27-Jun-14	3895		51
60	08-Jun-14	3328	44	64	30-Jun-14	2806		37
61	10-Jun-14	4390	58					

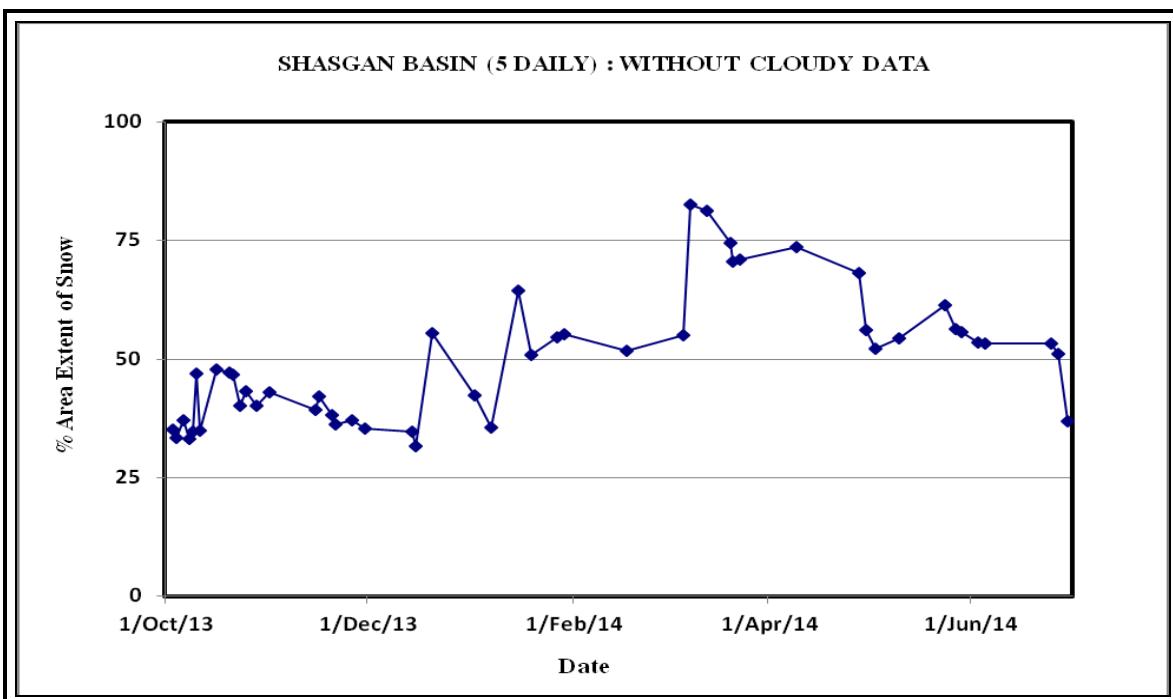
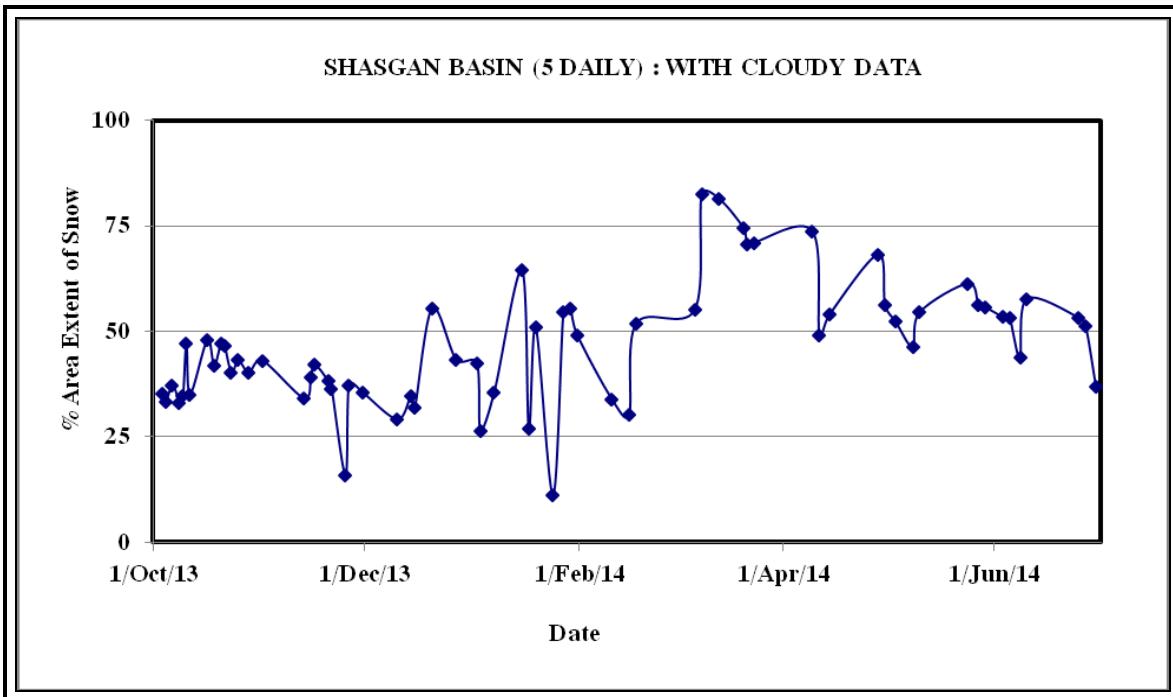
**AREAL EXTENT OF SNOW (10 DAILY)**

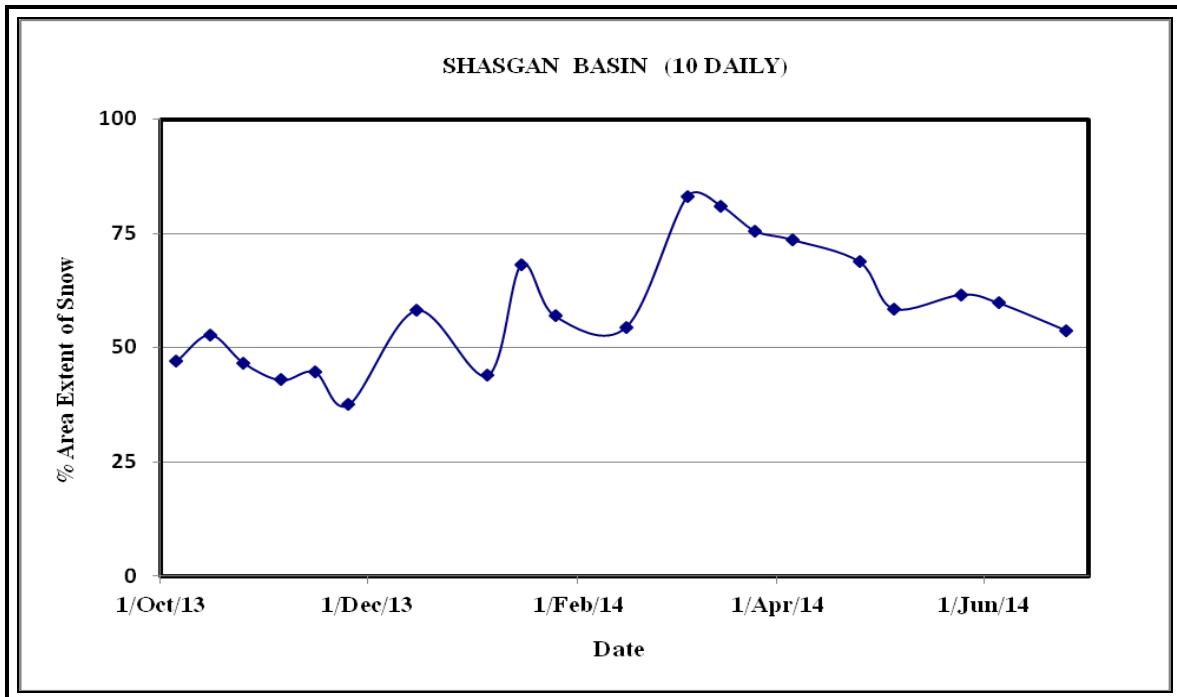
**BASIN NAME: SHASGAN**

**BASIN AREA: 7613 sq km**

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
<b>October 2013</b>				<b>November 2013</b>			
1	5-Oct-13	3578	47	4	5-Nov-13	3271	43
2	15-Oct-13	4026	53	5	15-Nov-13	3409	45
3	25-Oct-13	3555	47	6	25-Nov-13	2864	38
<b>December 2013</b>				<b>January 2014</b>			
7	15-Dec-13	4430	58	8	5-Jan-14	3348	44
				9	15-Jan-14	5188	68
				10	25-Jan-14	4336	57
<b>February 2014</b>				<b>March 2014</b>			
11	15-Feb-14	4152	55	12	5-Mar-14	6283	83
				13	15-Mar-14	6194	81
				14	25-Mar-14	5753	76
<b>April 2014</b>				<b>May 2014</b>			
15	5-Apr-14	5606	74	17	5-May-14	4460	59
16	25-Apr-14	5236	69	18	25-May-14	4693	62
<b>June 2014</b>							
19	5-Jun-14	4557	60				
20	25-Jun-14	4100	54				

## Snow cover depletion curve

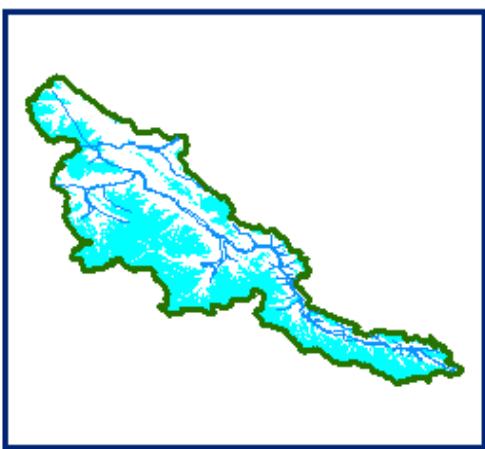




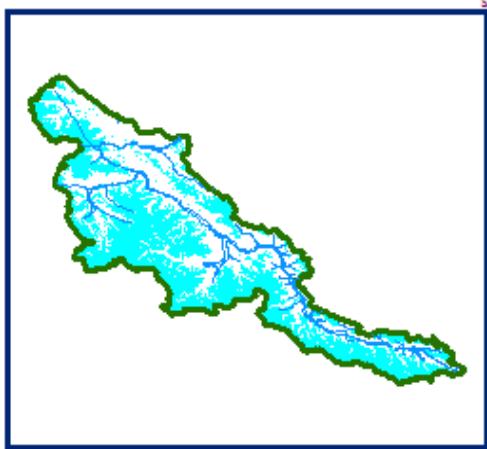
# *SNOW COVER MAP*

## SNOW COVER MAP

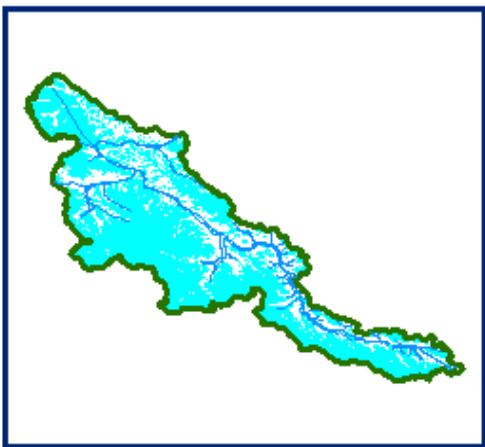
: SHASGAN BASIN



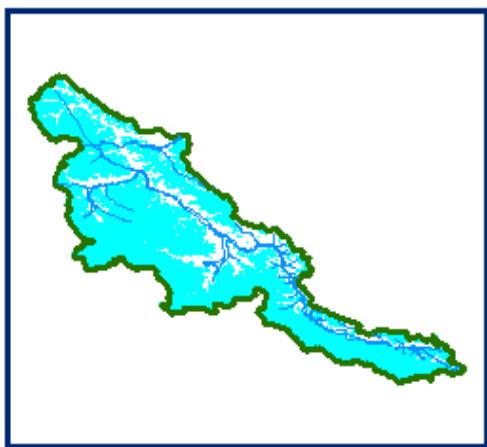
04 OCTOBER 2013



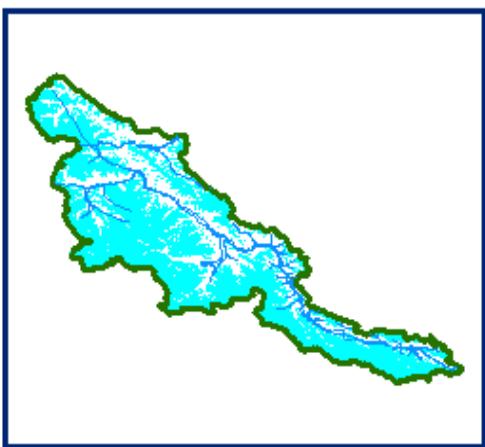
09 OCTOBER 2013



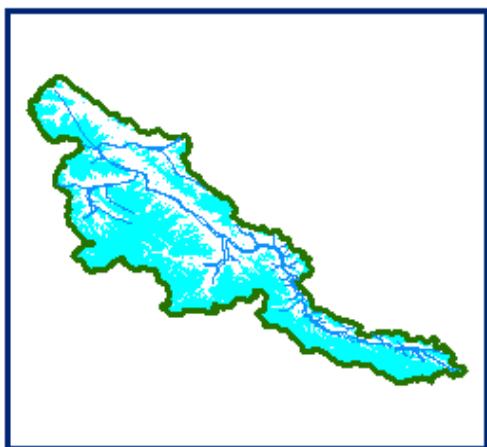
10 OCTOBER 2013



20 OCTOBER 2013



25 OCTOBER 2013

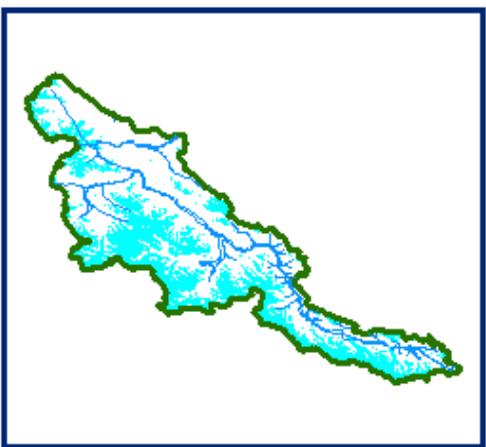


28 OCTOBER 2013

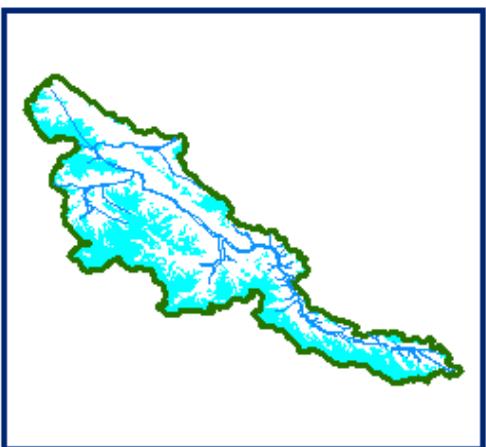
SNOW

0 25 50 100 150 200  
Kilometers

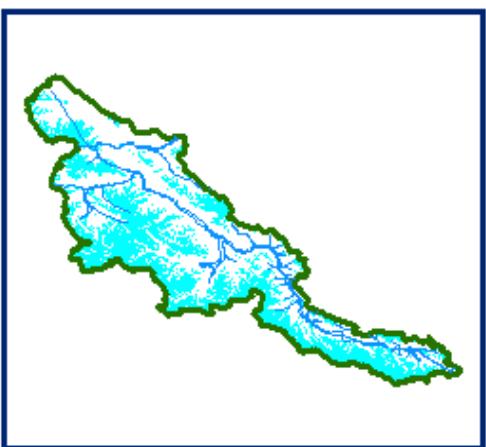
**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



**DATA USED**  
**03 OCTOBER 2013**  
**06 OCTOBER 2013**  
**10 OCTOBER 2013**



**DATA USED**  
**20 OCTOBER 2013**  
**18 OCTOBER 2013**



**DATA USED**  
**21 OCTOBER 2013**  
**25 OCTOBER 2013**  
**28 OCTOBER 2013**



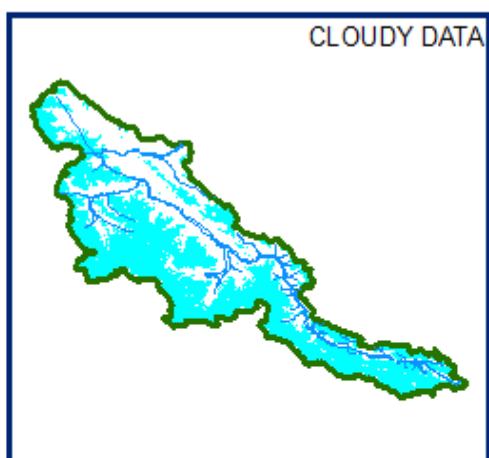
**SNOW**

0 25 50 100 150 200  
Kilometers

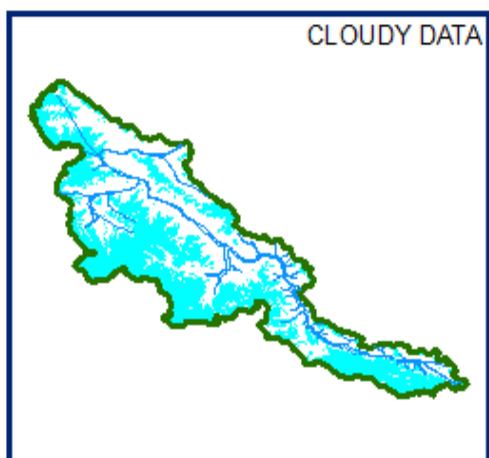
A scale bar at the bottom of the map frame, showing distances from 0 to 200 kilometers. The word "Kilometers" is written below the scale bar.

## SNOW COVER MAP

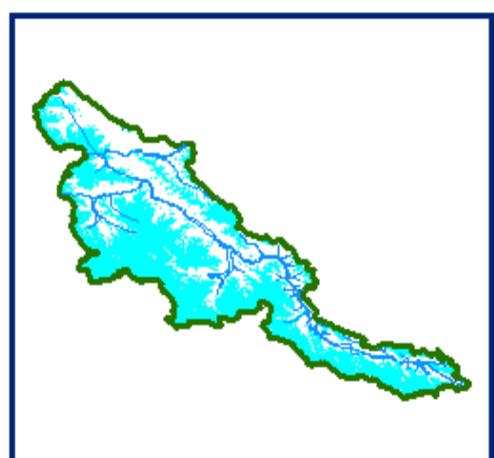
## SHASGAN BASIN



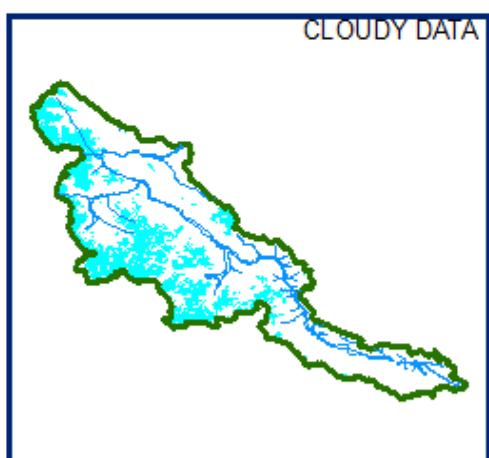
01 NOVEMBER 2013



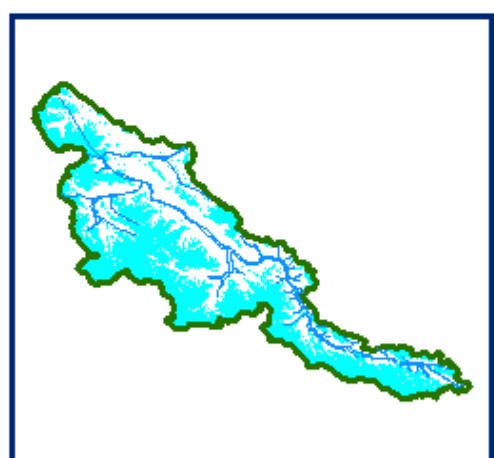
13 NOVEMBER 2013



20 NOVEMBER 2013



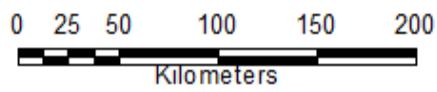
25 NOVEMBER 2013



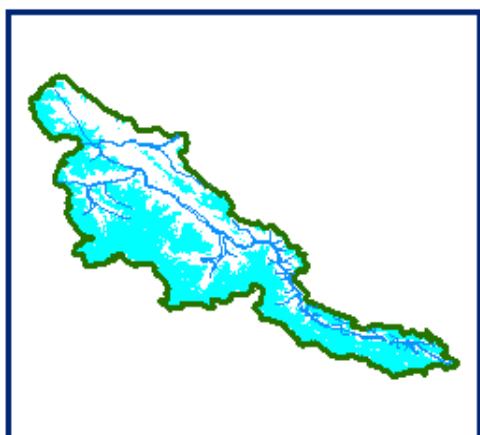
30 NOVEMBER 2013



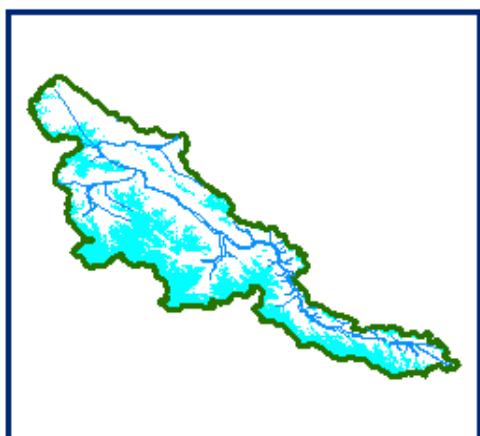
SNOW



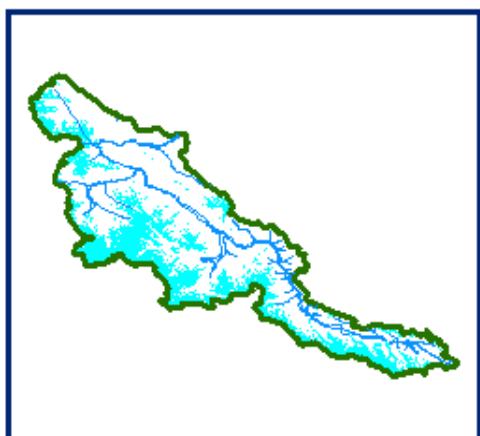
**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



**DATA USED  
01 NOVEMBER 2013**



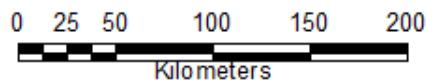
**DATA USED  
20 NOVEMBER 2013  
15 NOVEMBER 2013  
13 NOVEMBER 2013**



**DATA USED  
30 NOVEMBER 2013  
25 NOVEMBER 2013  
21 NOVEMBER 2013**

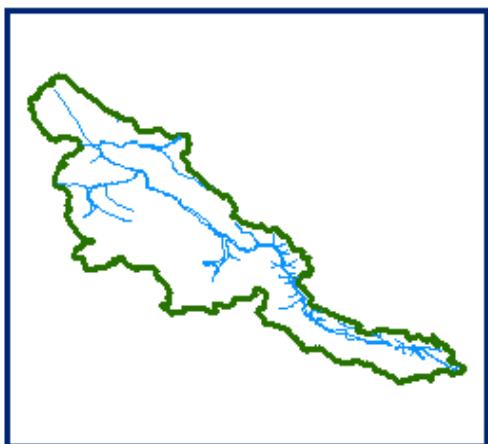


**SNOW**

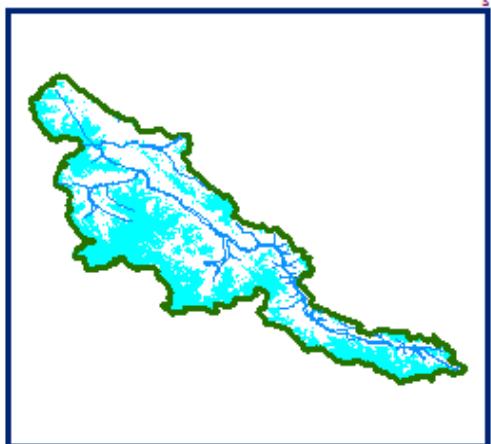


**SNOW COVER MAP**

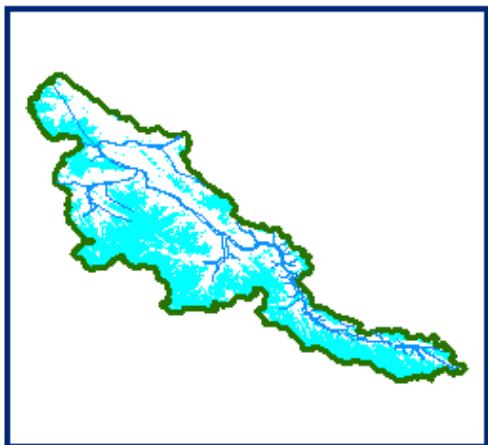
: SHASGAN BASIN



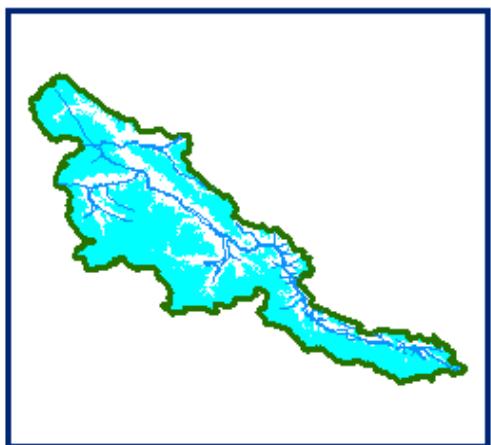
**DATA NOT AVAILABLE**



**10 DECEMBER 2013**



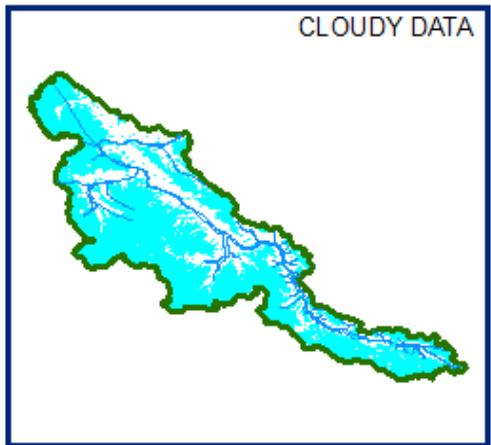
**15 DECEMBER 2013**



**20 DECEMBER 2013**



**DATA NOT AVAILABLE**

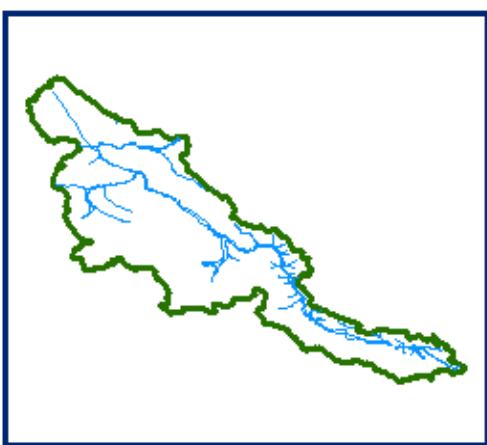


**CLOUDY DATA**

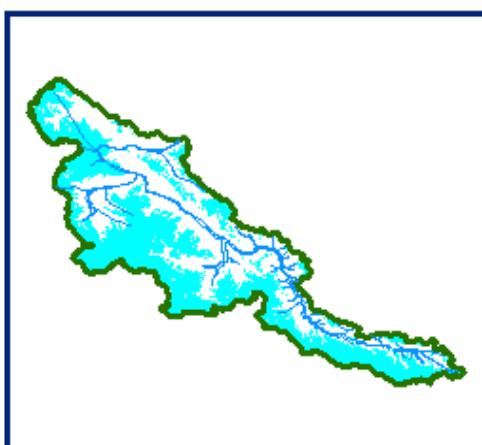
**SNOW**

0 25 50 100 150 200  
Kilometers

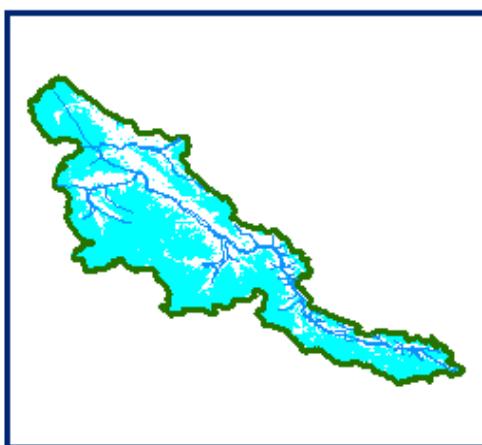
**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
20 DECEMBER 2013  
15 DECEMBER 2013  
14 DECEMBER 2013**



**DATA USED  
27 DECEMBER 2013**

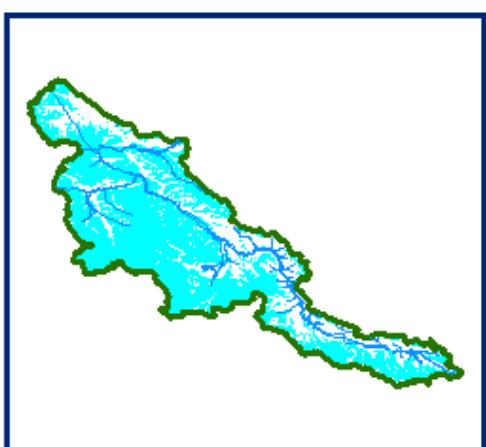
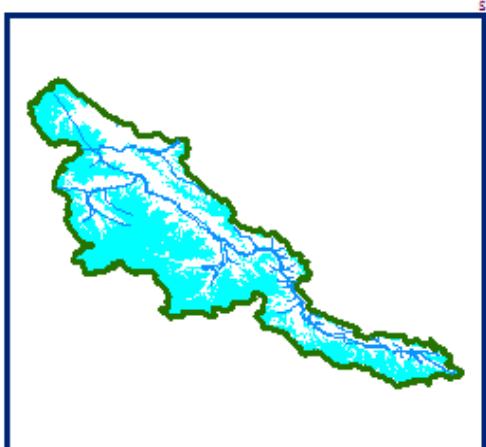
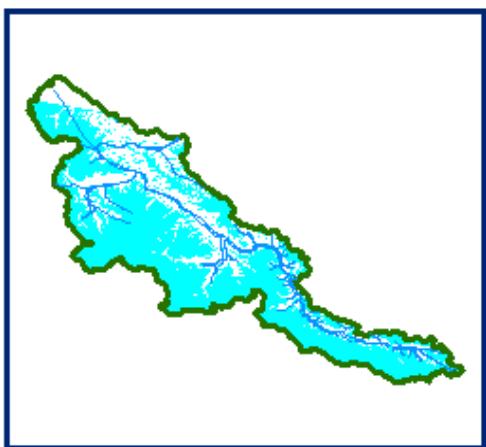
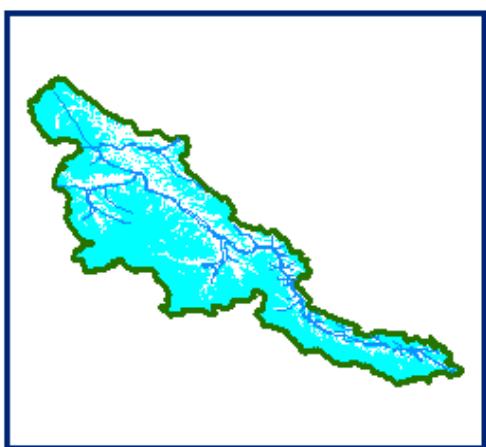
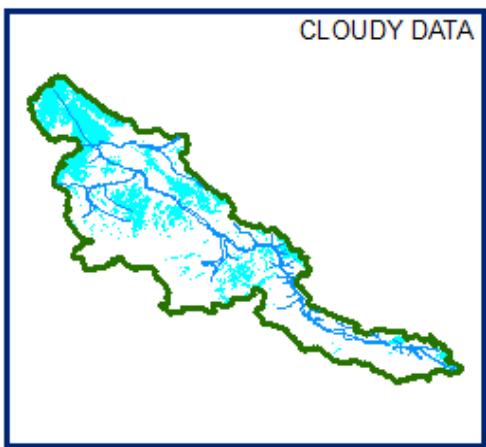
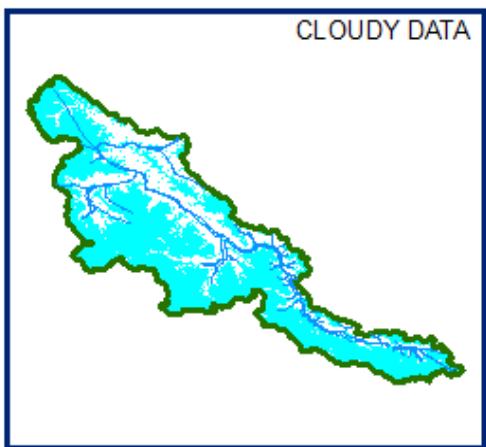


**SNOW**

0    25    50    100    150    200  
 Kilometers

**SNOW COVER MAP**

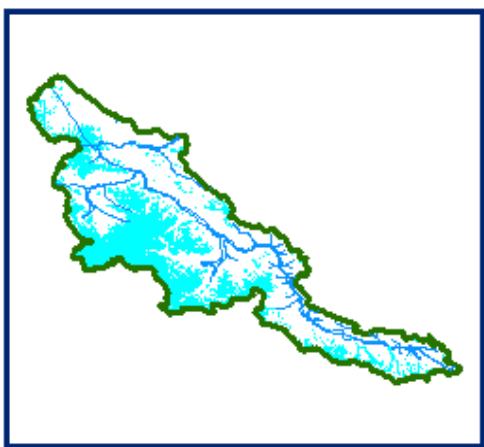
:

**SHASGAN BASIN****02 JANUARY 2014****07 JANUARY 2014****15 JANUARY 2014****19 JANUARY 2014****24 JANUARY 2014****31 JANUARY 2014****SNOW**

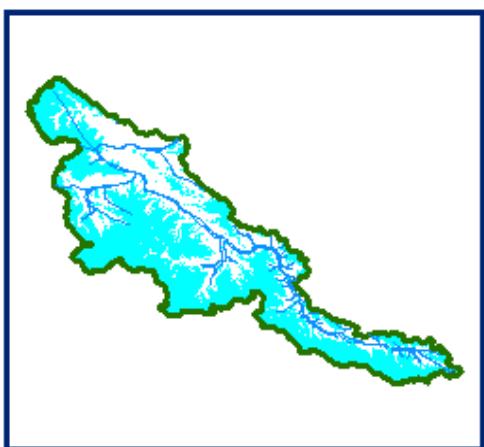
0 25 50 100 150 200  
Kilometers

A scale bar at the bottom of the map frame, indicating distances from 0 to 200 kilometers. The word "Kilometers" is written below the scale bar.

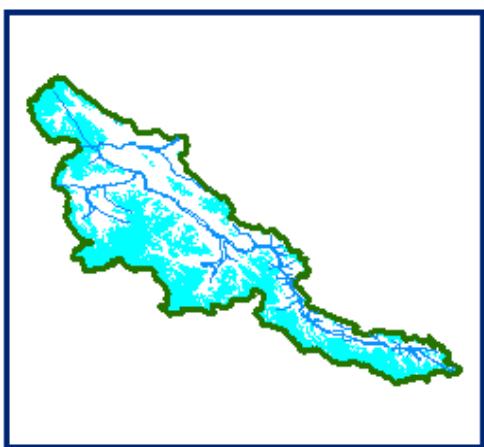
**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



**DATA USED**  
**07 JANUARY 2014**  
**02 JANUARY 2014**



**DATA USED**  
**15 JANUARY 2014**  
**19 JANUARY 2014**



**DATA USED**  
**27 JANUARY 2014**  
**24 JANUARY 2014**  
**29 JANUARY 2014**

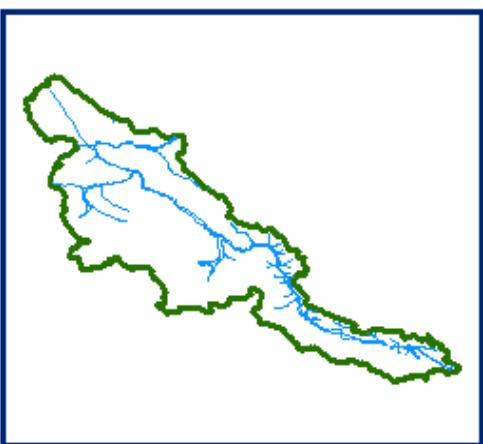


**SNOW**

0    25    50    100    150    200  
Kilometers

**SNOW COVER MAP**

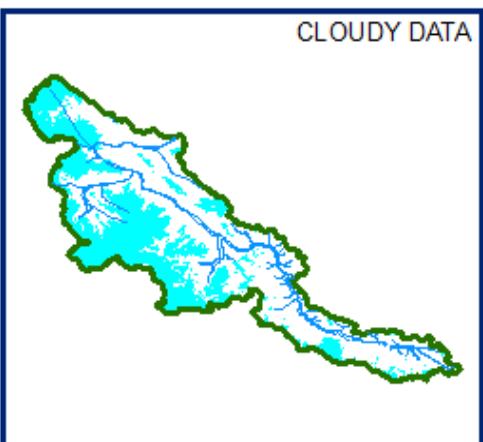
**SHASGAN BASIN**



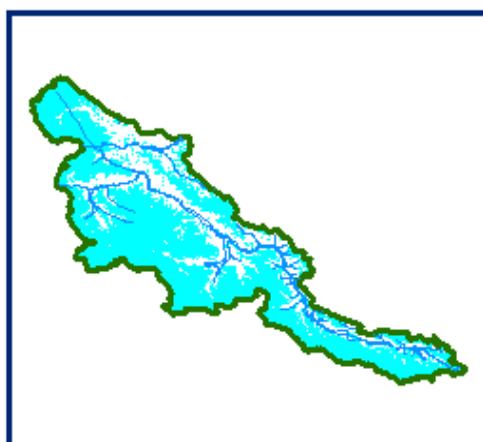
**DATA NOT AVAILABLE**



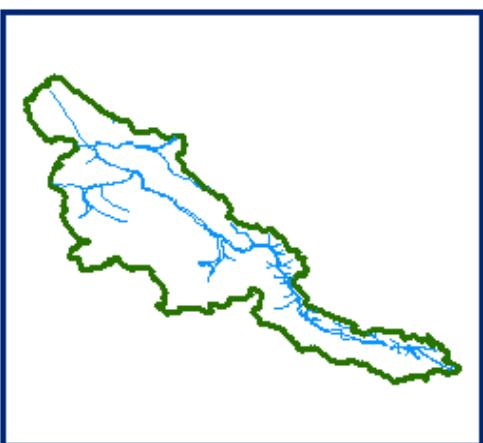
**DATA NOT AVAILABLE**



**15 FEBRUARY 2014**



**17 FEBRUARY 2014**



**DATA NOT AVAILABLE**



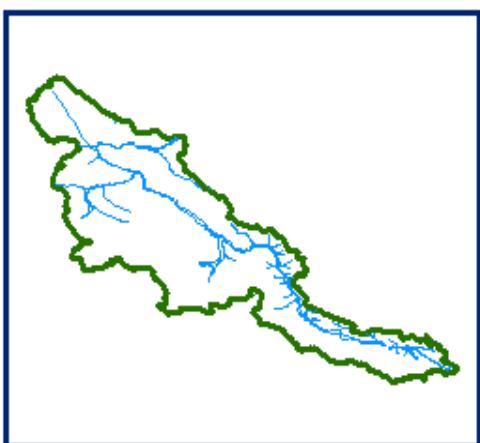
**DATA NOT AVAILABLE**



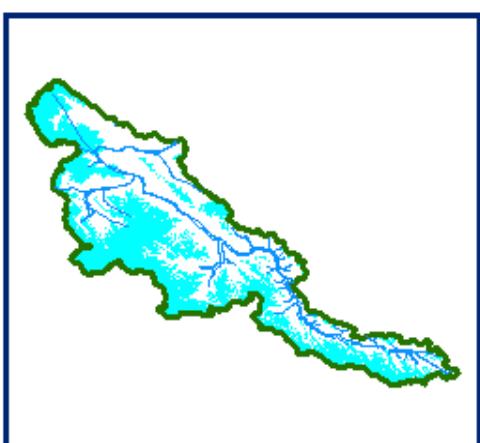
**SNOW**

0 25 50 100 150 200  
Kilometers

**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



**DATA USED  
DATA NOT AVAILABLE**



**DATA USED  
17 FEBRUARY 2014  
15 FEBRUARY 2014**



**DATA USED  
DATA NOT AVAILABLE**

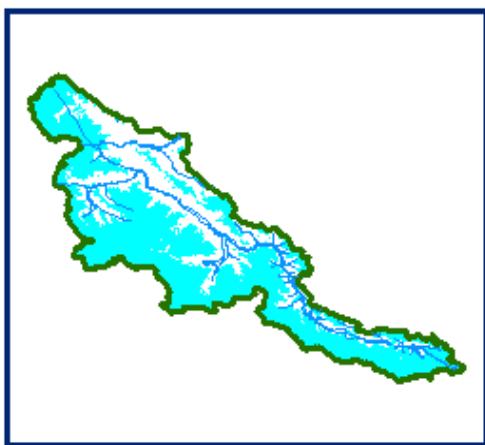


**SNOW**

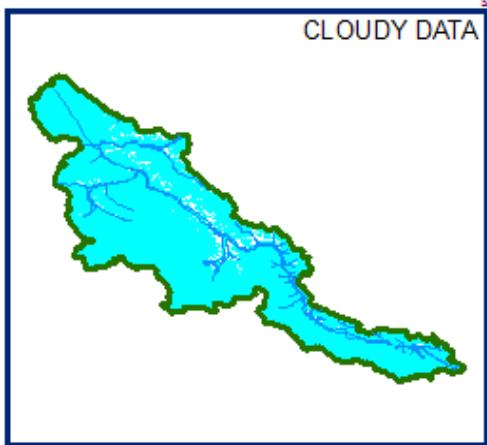
0 25 50 100 150 200  
Kilometers

**SNOW COVER MAP**

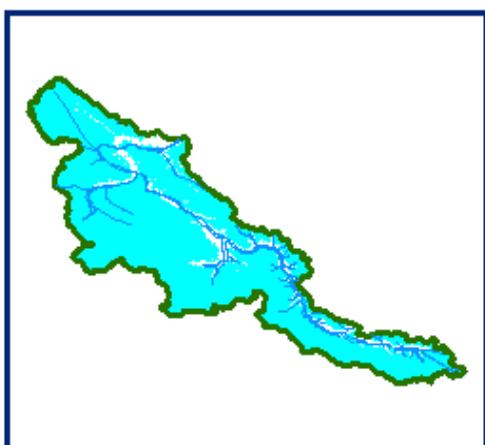
: SHASGAN BASIN



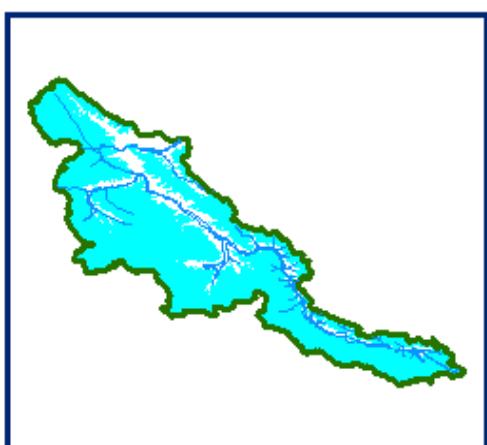
**06 MARCH 2014**



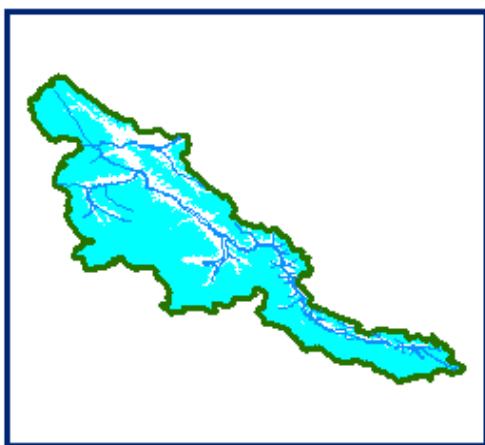
**08 MARCH 2014**  
**21 MARCH 2014**



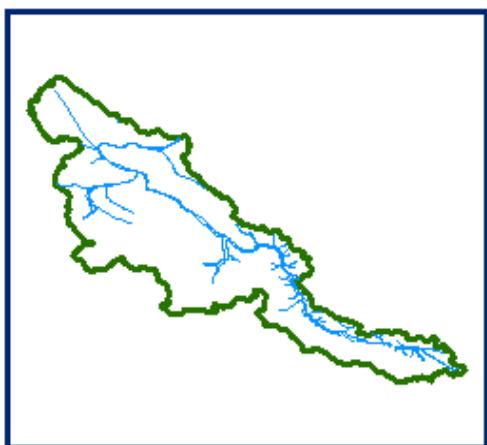
**13 MARCH 2014**



**20 MARCH 2014**



**23 MARCH 2014**

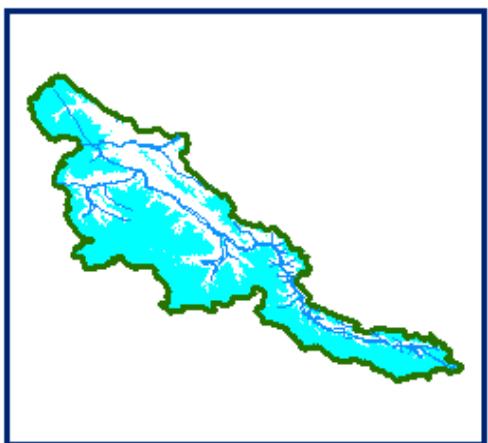


**DATA NOT AVAILABLE**

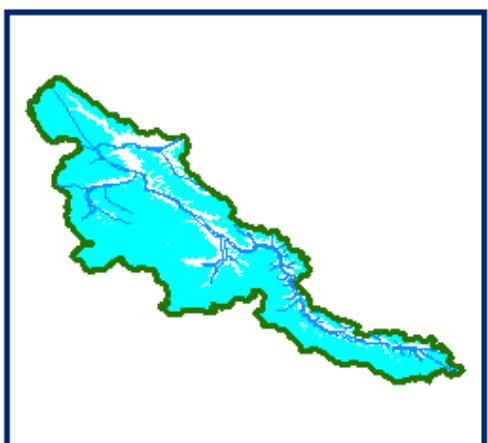


0 25 50 100  
150 200  
Kilometers

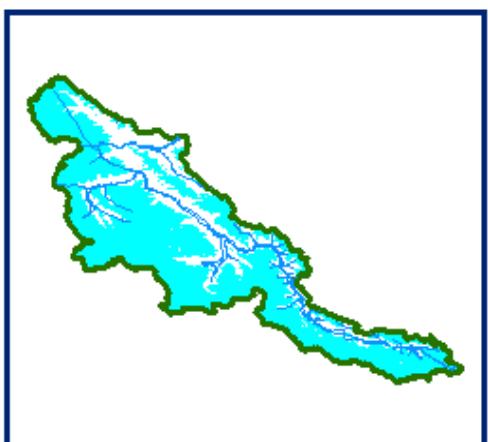
**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



**DATA USED  
06 MARCH 2014  
08 MARCH 2014**



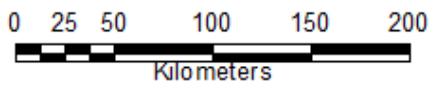
**DATA USED  
13 MARCH 2014  
20 MARCH 2014**



**DATA USED  
23 MARCH 2014  
21 MARCH 2014**

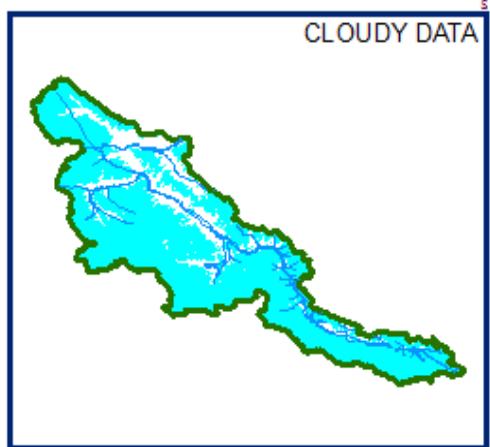
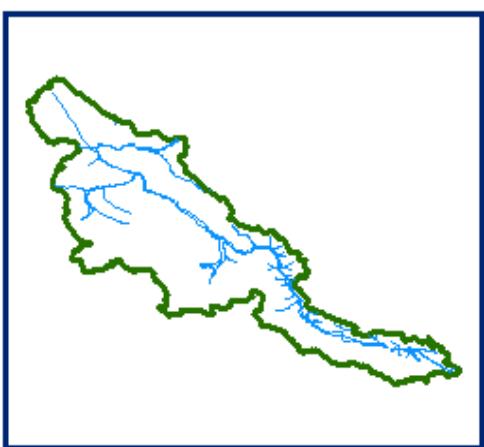


**SNOW**



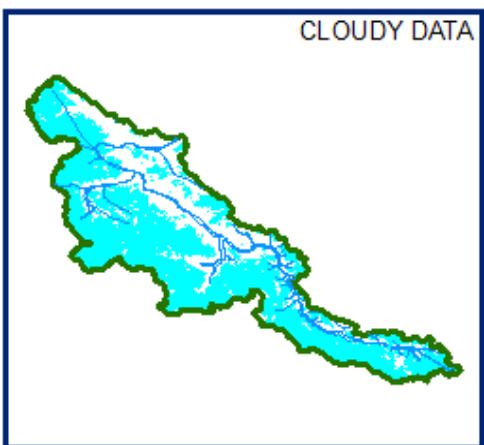
## SNOW COVER MAP

: SHASGAN BASIN

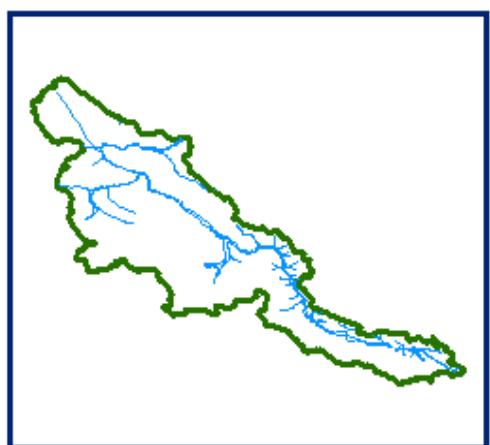


DATA NOT AVAILABLE

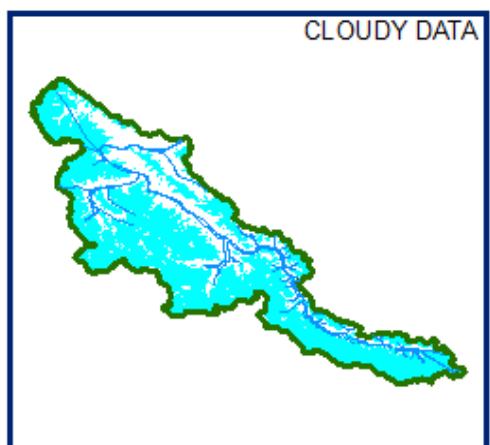
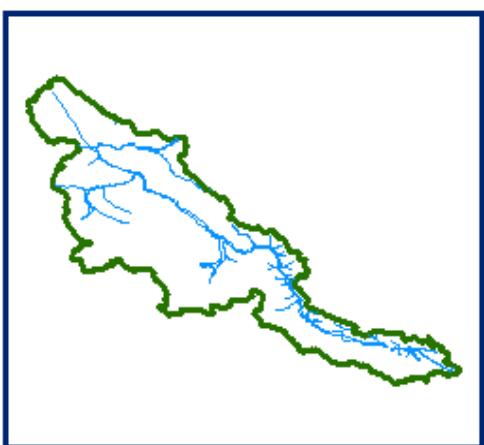
09 APRIL 2014



14 APRIL 2014



DATA NOT AVAILABLE



DATA NOT AVAILABLE

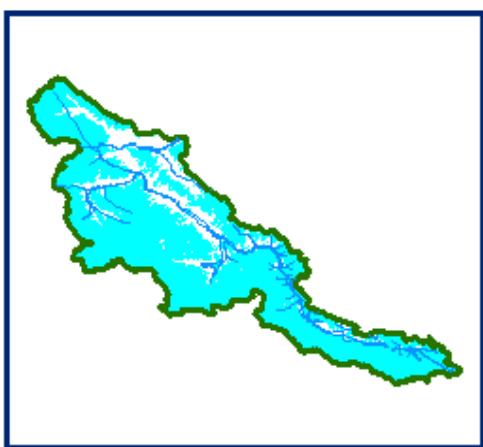
30 APRIL 2014



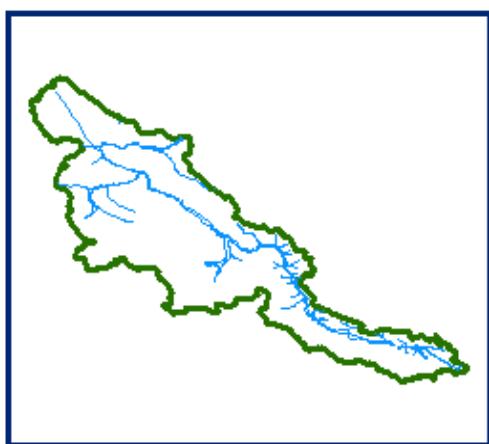
SNOW

0 25 50 100 150 200  
Kilometers

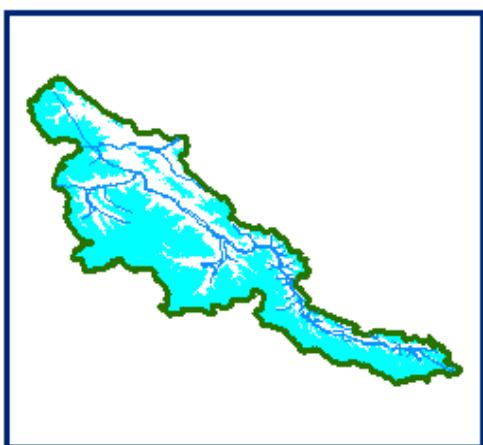
**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



**DATA USED  
09 APRIL 2014**



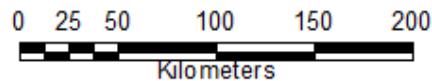
**DATA USED  
DATA NOT AVAILABLE**



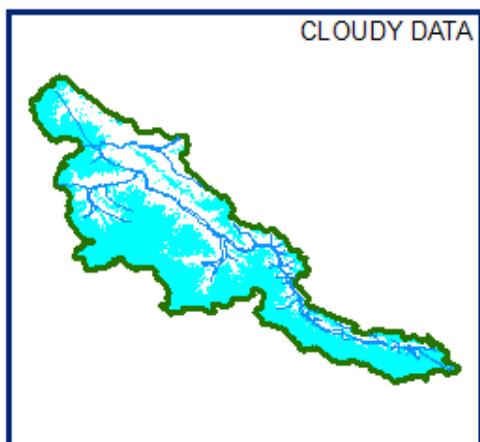
**DATA USED  
28 APRIL 2014  
30 APRIL 2014**



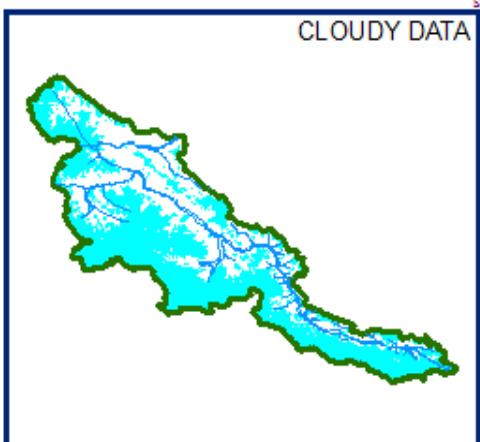
**SNOW**



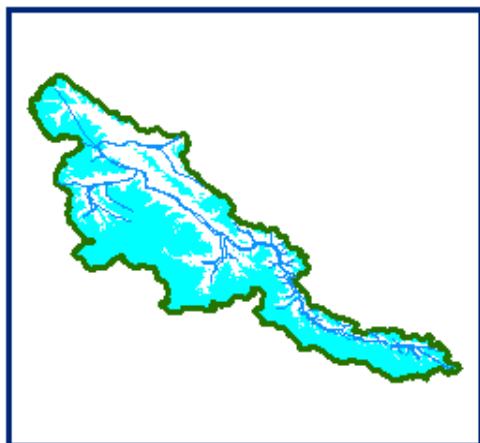
**SNOW COVER MAP : SHASGAN BASIN**



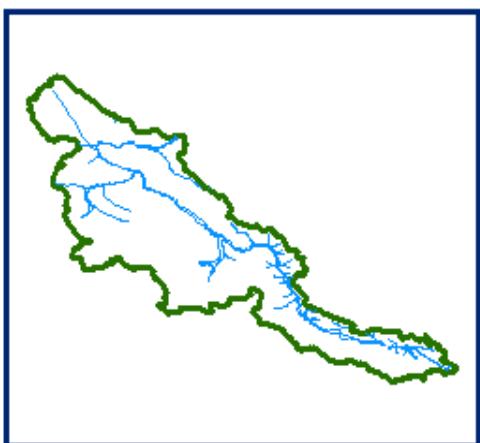
03 MAY 2014



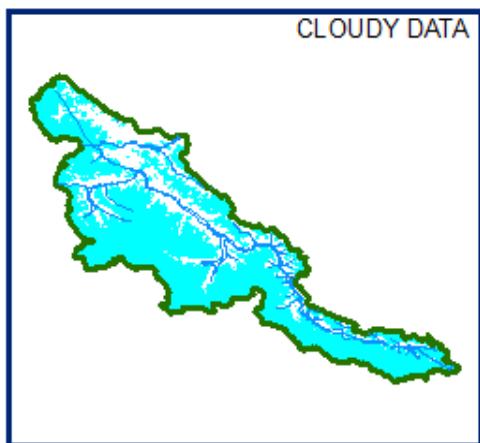
08 MAY 2014



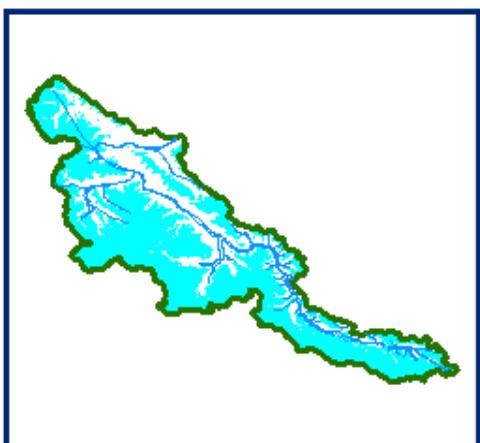
10 MAY 2014



DATA NOT AVAILABLE



24 MAY 2014

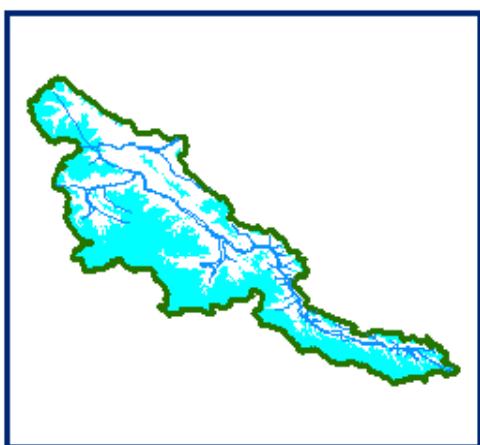


29 MAY 2014

SNOW

0 25 50 100 150 200  
Kilometers

**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



DATA USED

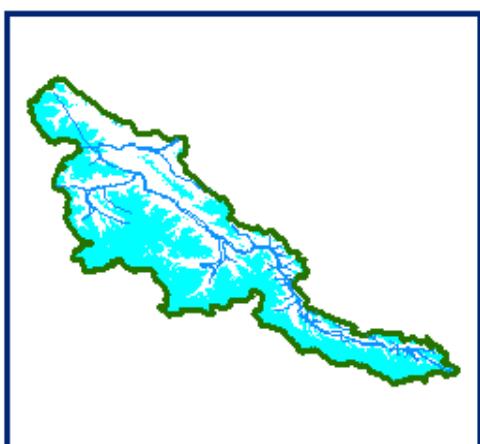
**10 MAY 2014**

**08 MAY 2014**

**03 MAY 2014**



DATA USED  
**DATA NOT AVAILABLE**



DATA USED

**29 MAY 2014**

**24 MAY 2014**

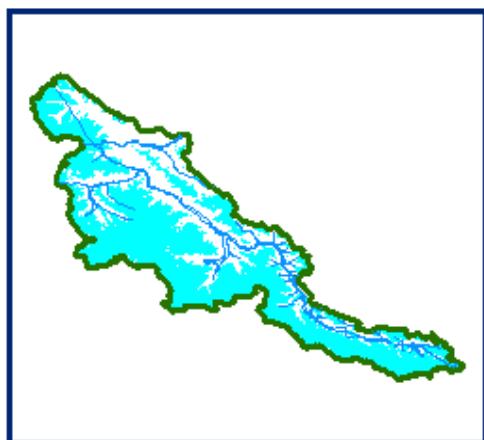
**27 MAY 2014**



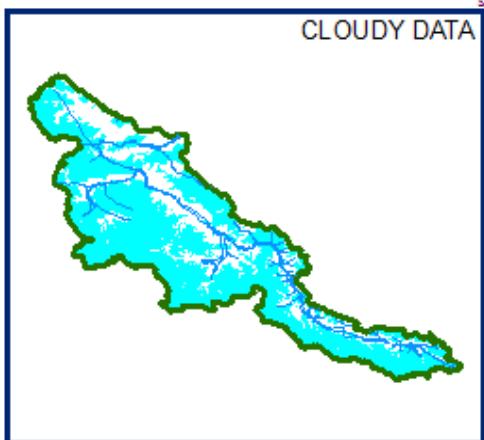
SNOW

0 25 50 100 150 200  
Kilometers

**SNOW COVER MAP : SHASGAN BASIN**



03 JUNE 2014



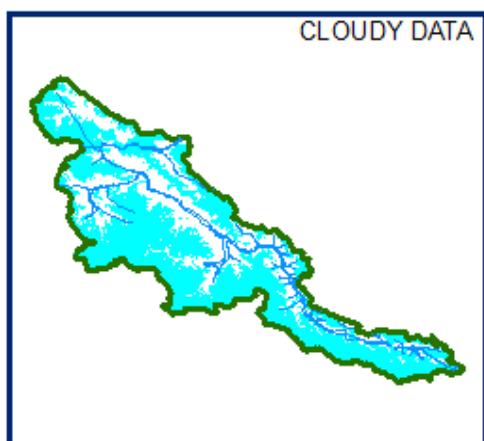
10 JUNE 2014



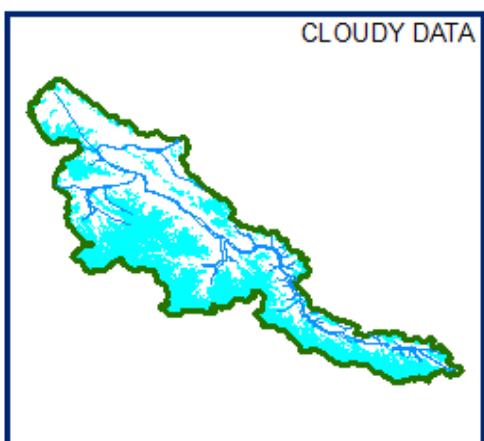
DATA NOT AVAILABLE



DATA NOT AVAILABLE



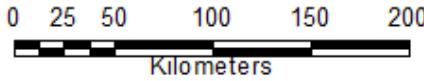
25 JUNE 2014



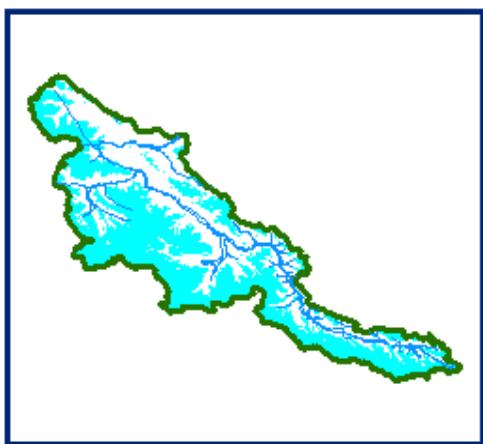
30 JUNE 2014



SNOW



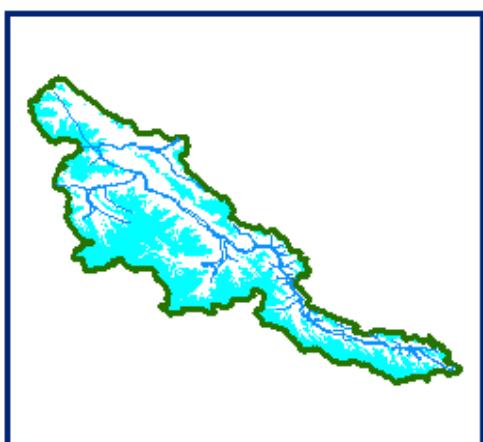
**10 DAILY SNOW COVER MAP: SHASGAN BASIN**



DATA USED  
**05 JUNE 2014**  
**10 JUNE 2014**  
**03 JUNE 2014**



DATA USED  
**DATA NOT AVAILABLE**



DATA USED  
**27 JUNE 2014**  
**30 JUNE 2014**  
**25 JUNE 2014**



SNOW

0 25 50 100 150 200  
Kilometers