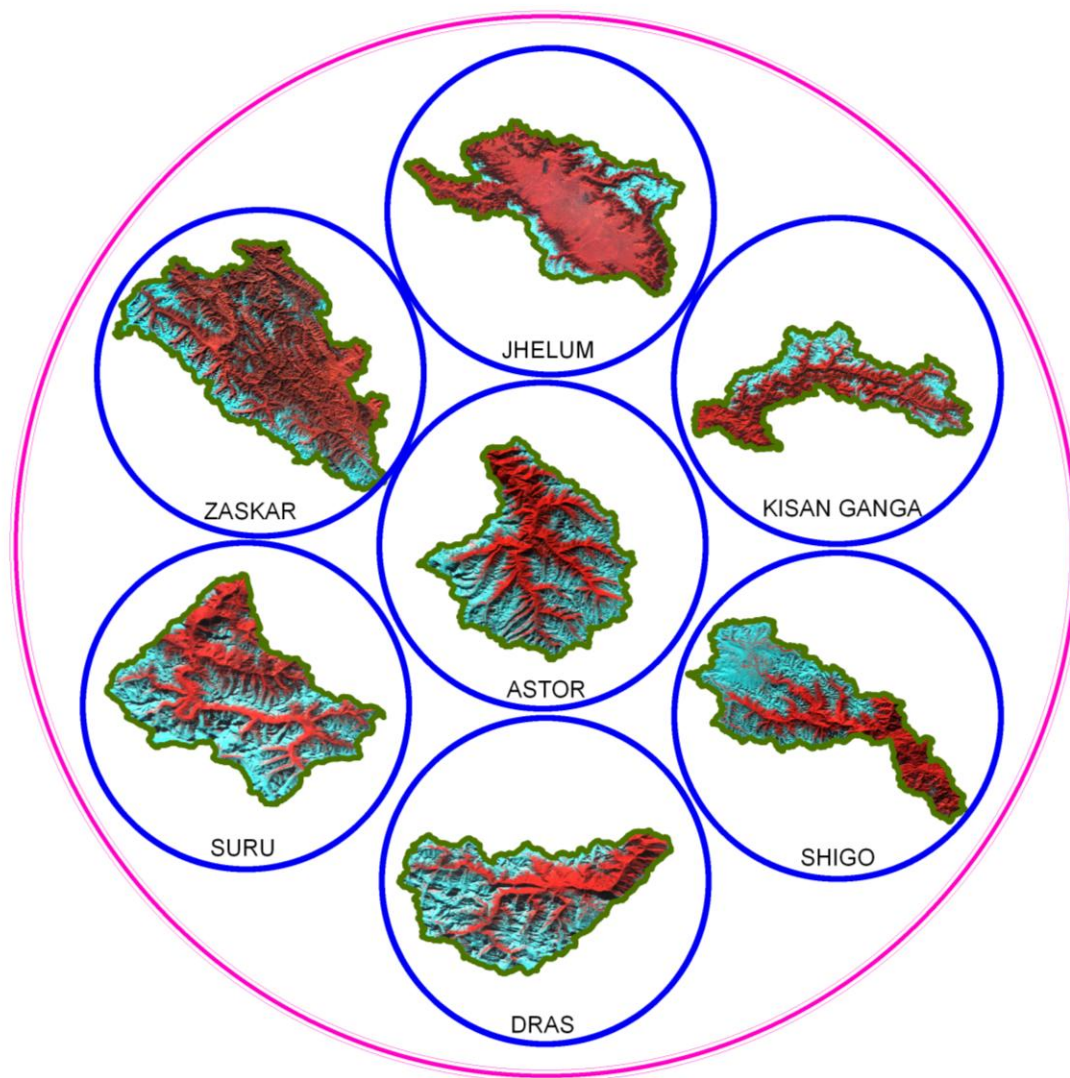


SNOW COVER ATLAS OF THE INDUS BASIN

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

Year 2013 -14

Volume I



Space Applications Centre (ISRO)
Ahmedabad - 380015

December 2014

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Sub-basins: Jhelum, Kisan ganga, Astor, Shigo, Dras, Suru and Zaskar

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DOCUMENT CONTROL AND DATA SHEET

Report Number	SAC/EPESA/GSAG/GSD/SGP/SN/ 99 /2014
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Title	Snow cover Atlas of the Indus basin
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Authors	B. P. Rathore, S. K. Singh, I Bahuguna, and A. S. Rajawat
No. of References	9
Originating Unit	Geo Sciences Division, Marine, Geo and Planetary Science Applications 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 Jhelum, Kisan ganga, Astor, Shigo, Dras, Suru and Zaskar. 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, Jhelum, Kisan ganga, Astor, Shigo, Dras, Suru and Zaskar basins.
Security Classification	Unrestricted
Distribution	Among concerned

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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 repetivity. 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 seven subbasins of the Indus basin. These are Jhelum, Kisan ganga , Astor, Shigo, Dras, Suru and Zaskar 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:

$$\text{NormalizedDifferenceSnowIndex(NDSI)} = (\text{band2} - \text{band5}) / (\text{band2} + \text{band5}) \quad ..(1)$$

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. Accumulation and ablation pattern in Astor and Dras is same. Accumulation and ablation pattern in Shigo and Suru is also same. In all the five basins accumulation starts from mid of November and ablation starts from mid of March. In Zaskar basin accumulation starts from January onwards ablation starts from April month. Accumulation starts from mid of December in Jhelum basin. Maximum snow was observed in end of February and ablation starts from March itself. It may be due lower altitude and latitude.

Acknowledgements

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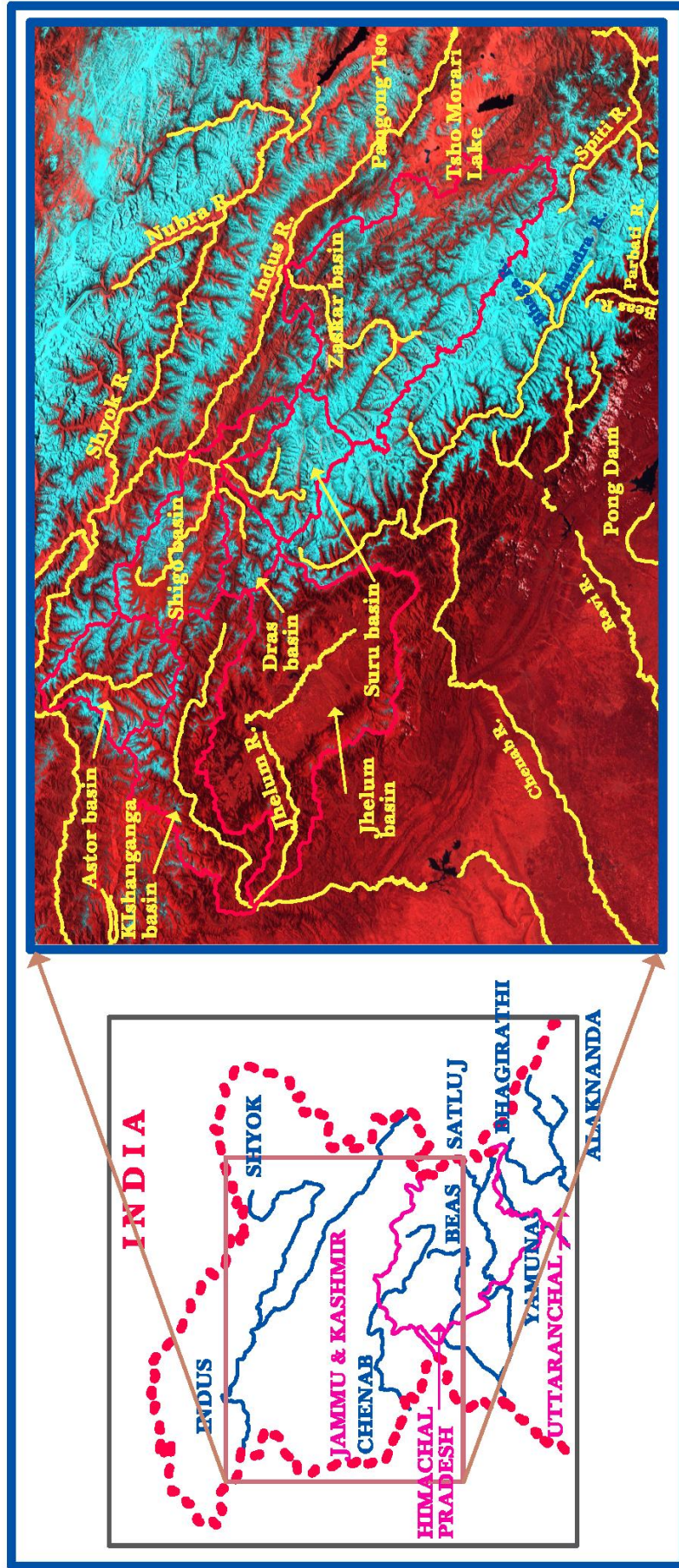


Figure 1: Location map of Jhelum, Kisan ganga, Astor, Shigo, Dras, Suru and Zaskar sub-basins (Part of Indus basin)

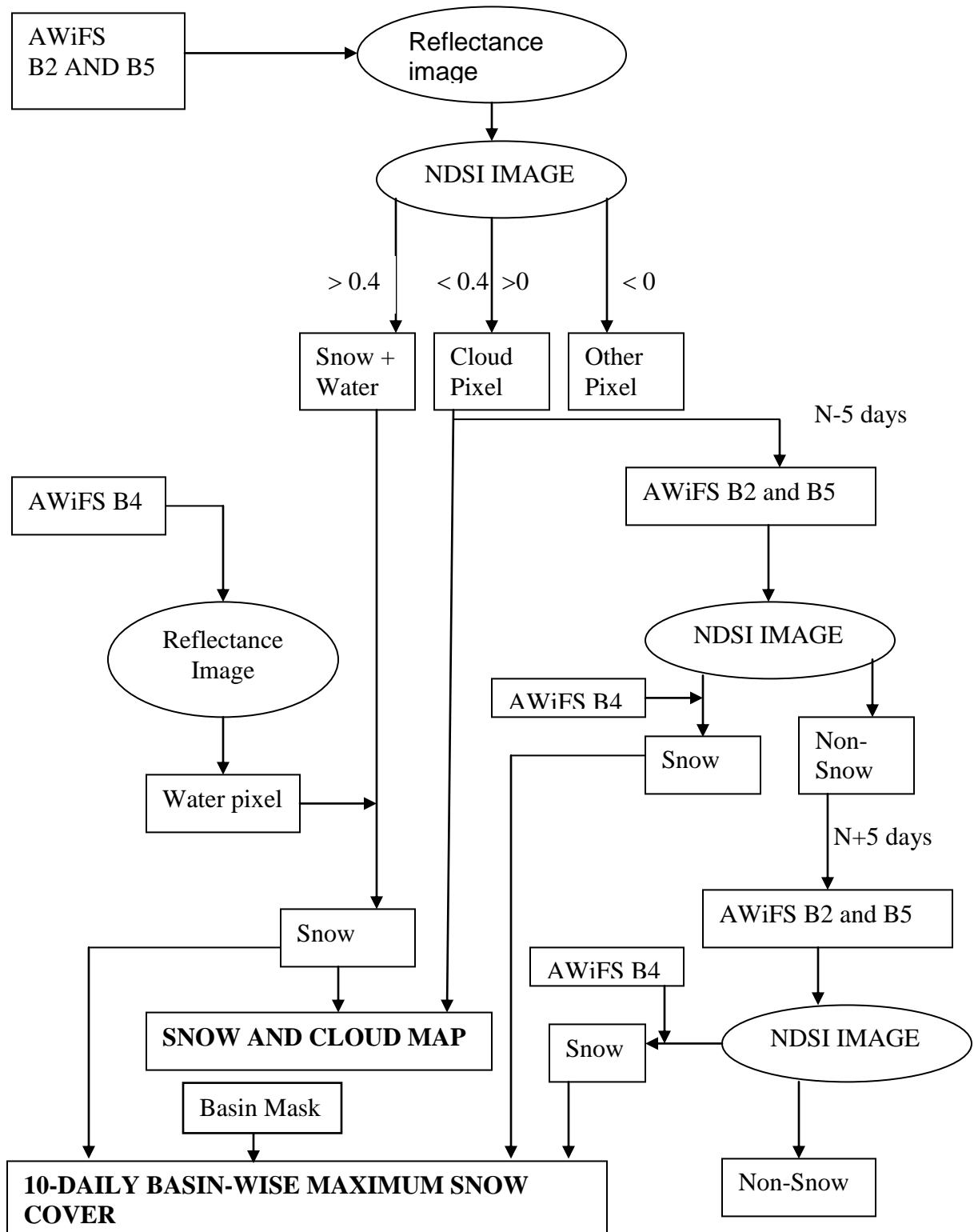


Figure 2: Algorithm for snow cover mapping using AWiFS data

JHELUM BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: JHELUM

BASIN AREA: 14472sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	3-Oct-13	48	0	6	18-Oct-13	240	2
2	6-Oct-13	82	1	7	23-Oct-13	275	2
3	11-Oct-13	91	1	8	25-Oct-13	372	3
4	15-Oct-13	1144	8	9	28-Oct-13	272	2
5	16-Oct-13	805	6				
November 2013							
10	1-Nov-14	1524	11	14	20-Nov-14	2222	15
11	11-Nov-14	3048	21	15	21-Nov-14	2091	14
12	15-Nov-14	2694	19	16	25-Nov-14	1793	12
13	16-Nov-14	2551	18	17	30-Nov-14	3373	23
December 2013							
18	10-Dec-14	1047	7	21	17-Dec-14	1048	7
19	14-Dec-14	268	2	22	24-Dec-14	3609	25
20	15-Dec-14	1476	10	23	26-Dec-14	6228	43
January 2014							
24	2-Jan-14	5875	41	30	24-Jan-14	4413	30
25	3-Jan-14	5093	35	31	26-Jan-14	4384	30
26	7-Jan-14	6498	45	32	27-Jan-14	4645	32
27	15-Jan-14	5064	35	33	29-Jan-14	6255	43
28	17-Jan-14	3505	24	34	31-Jan-14	6101	42
29	20-Jan-14	7760	54				
February 2014							
35	1-Feb-14	5695	39	40	17-Feb-14	9159	63
36	8-Feb-14	8634	60	41	20-Feb-14	5111	35
37	10-Feb-14	7589	52	42	24-Feb-14	5430	38
38	13-Feb-14	9444	65	43	25-Feb-14	5926	41
39	15-Feb-14	6561	45				
March 2014							
44	6-Mar-14	5365	37	48	21-Mar-14	9683	67
45	13-Mar-14	7680	53	49	25-Mar-14	2405	17
46	16-Mar-14	4300	30	50	30-Mar-14	4115	28
47	20-Mar-14	6433	44				
April 2014							
51	9-Apr-14	4410	30	52	13-Apr-14	2897	20

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
53	14-Apr-14	3890	27	56	28-Apr-14	4311	30
54	21-Apr-14	5286	37	57	30-Apr-14	4191	29
55	23-Apr-14	3446	24				
May 2014							
58	3-May-14	4248	29	62	22-May-14	1945	13
59	7-May-14	2787	19	63	26-May-14	2232	15
60	10-May-14	3234	22	64	27-May-14	2528	17
61	17-May-14	4010	28	65	31-May-14	6912	48
June 2014							
66	1-Jun-14	2105	15	70	24-Jun-14	1041	7
67	5-Jun-14	2347	16	71	25-Jun-14	825	6
68	10-Jun-14	1630	11	72	27-Jun-14	941	7
69	15-Jun-14	1683	12	73	29-Jun-14	606	4

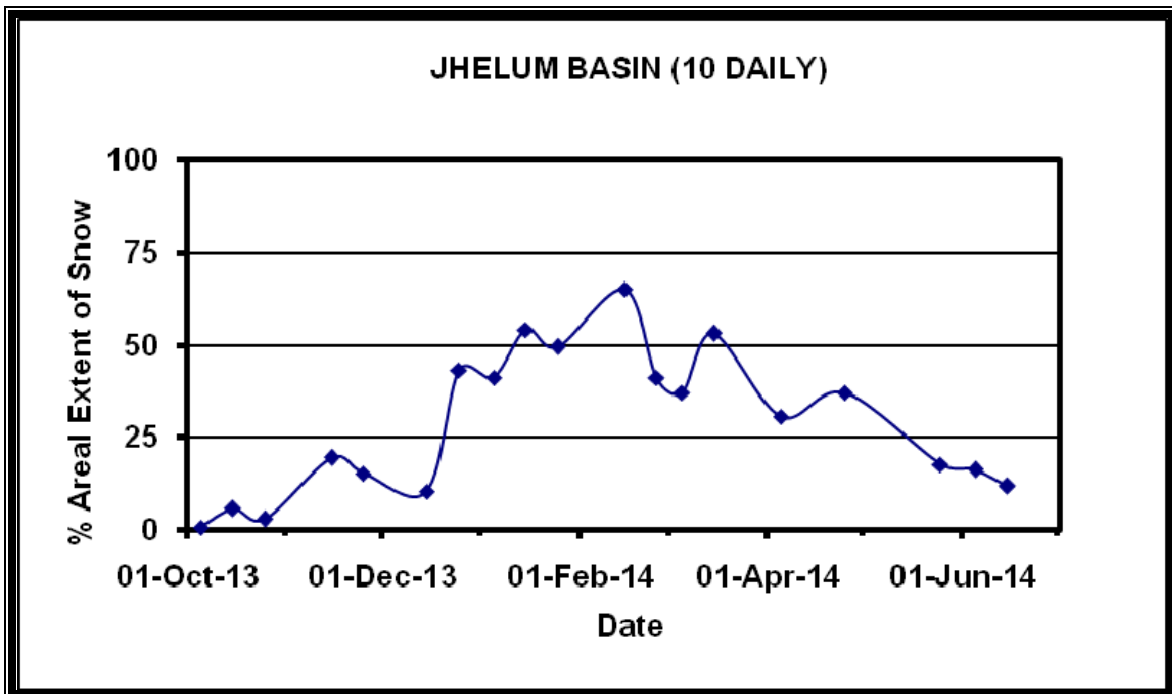
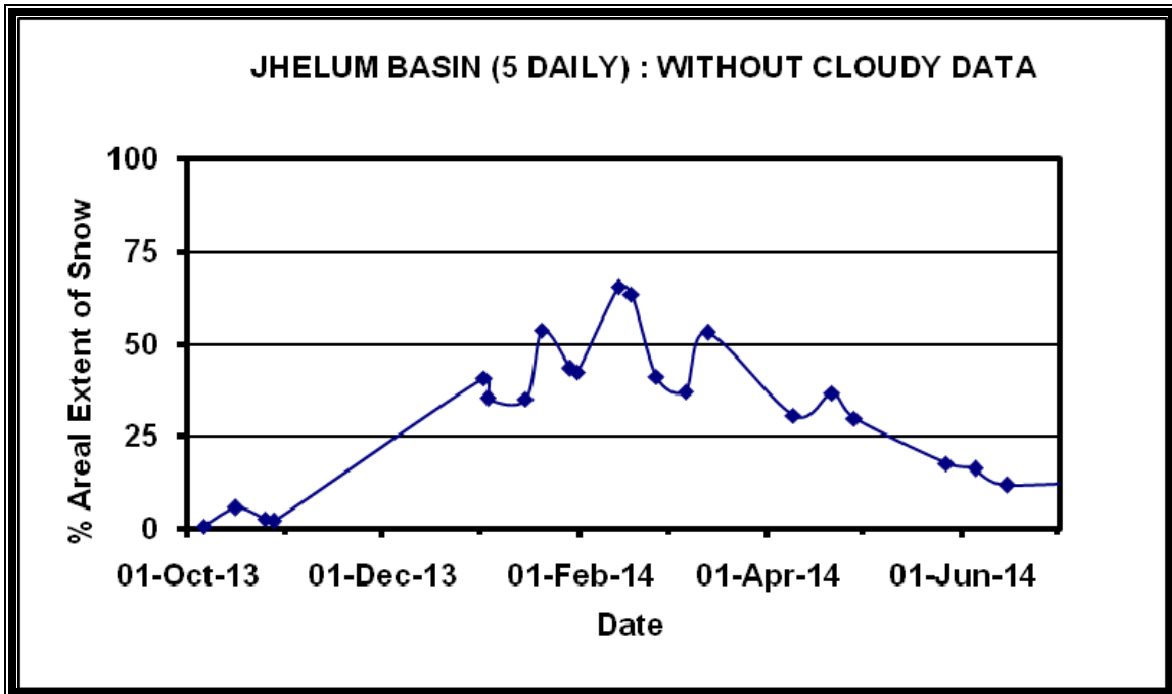
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: JHELUM

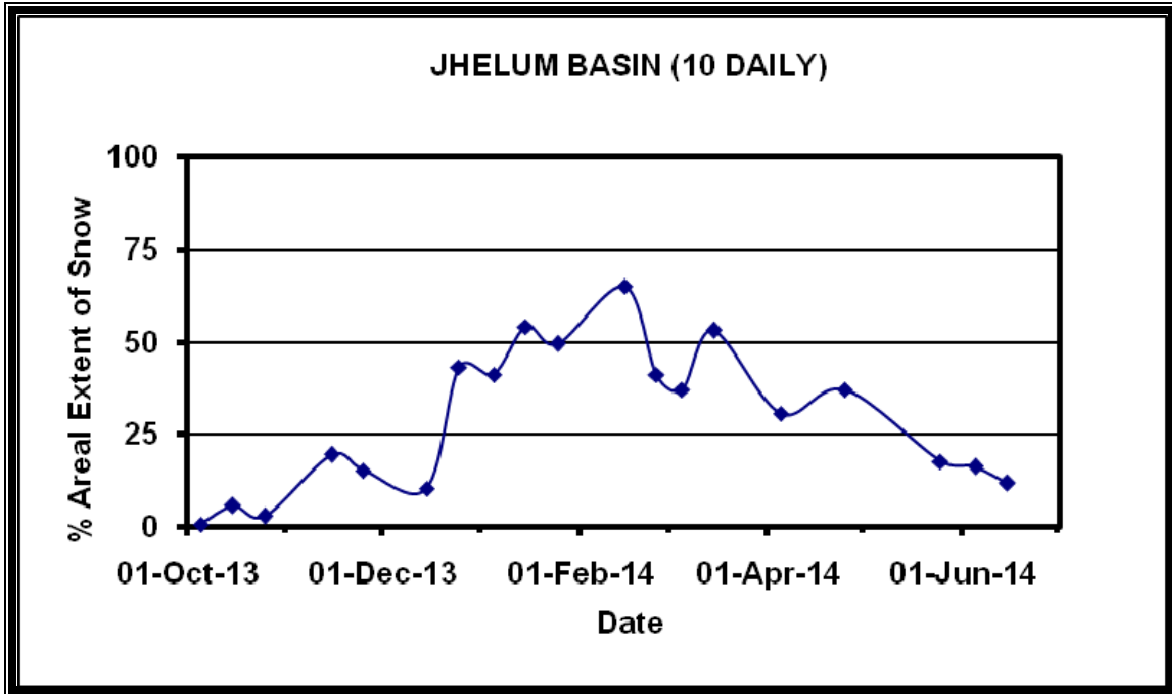
BASIN AREA: 14472 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq. km)	Snow cover (%)
October 2013							
1	5-Oct-13	82	1	3	25-Oct-13	394	3
2	15-Oct-13		6				
November 2013							
4	15-Nov-14	2799	19	5	25-Nov-14	2188	15
December 2013							
6	15-Dec-14	1476	10	7	25-Dec-14	6223	43
January 2014							
8	5-Jan-14	5934	41	10	25-Jan-14	7137	49
9	15-Jan-14	7815	54				
February 2014							
11	15-Feb-14	9407	65	12	25-Feb-14	5926	41
March 2014							
13	5-Mar-14	5365	37	14	15-Mar-14	7680	53
April 2014							
15	5-Apr-14	4410	30	16	25-Apr-14	5355	37
May 2014							
17	25-May-14	2528	17				
June 2014							
18	5-Jun-14	2347	16	19	15-Jun-14	1683	12

Snow cover depletion curve



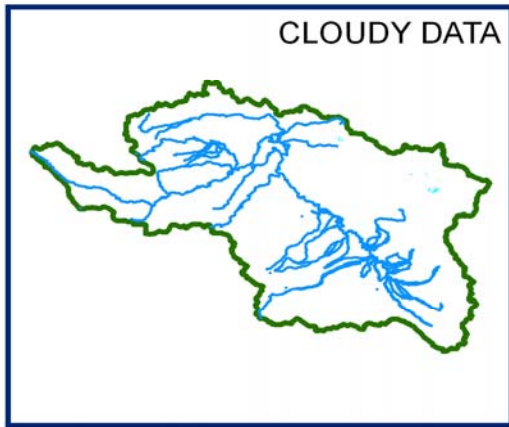
Snow cover depletion curve



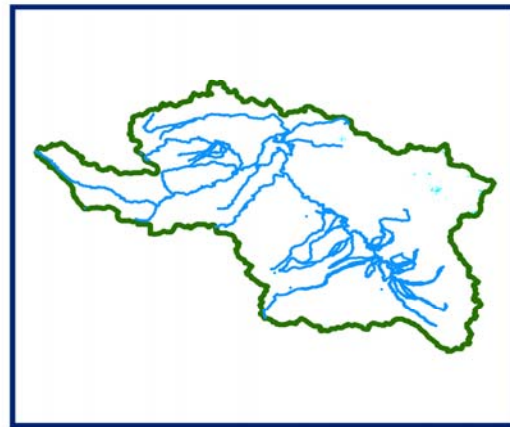
SNOW COVER MAP

SNOW COVER MAP:

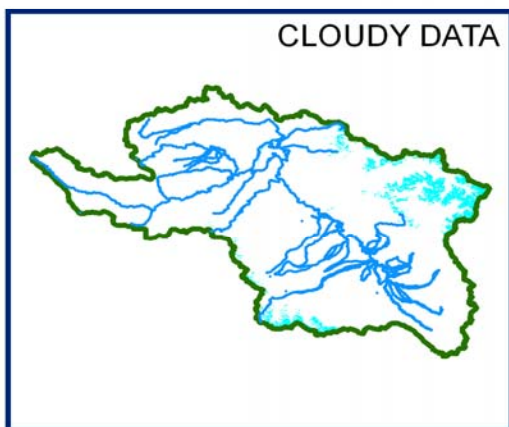
JHELUM BASIN



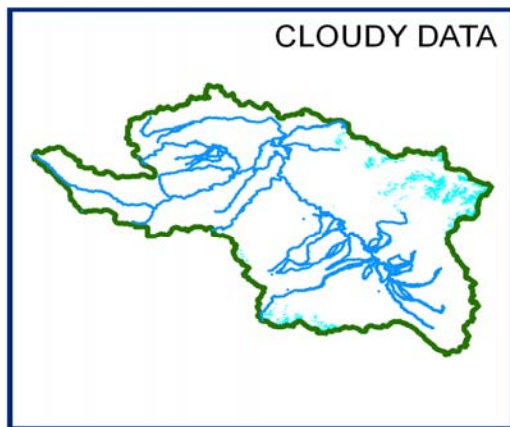
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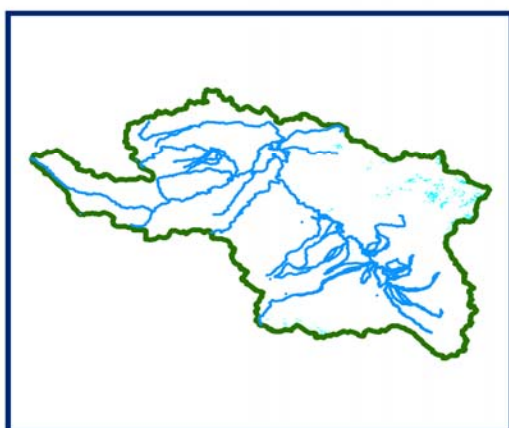
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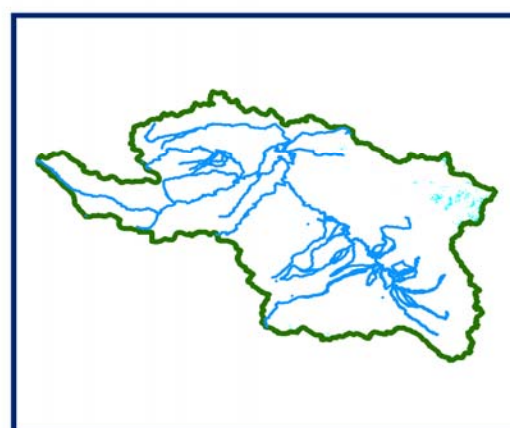
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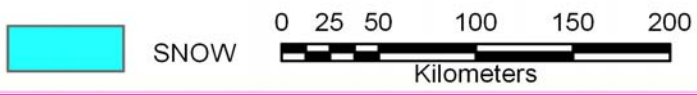
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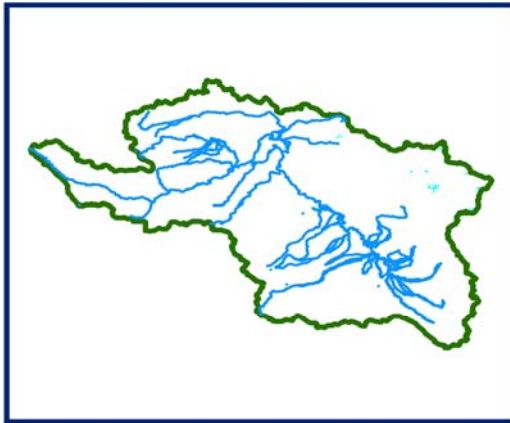
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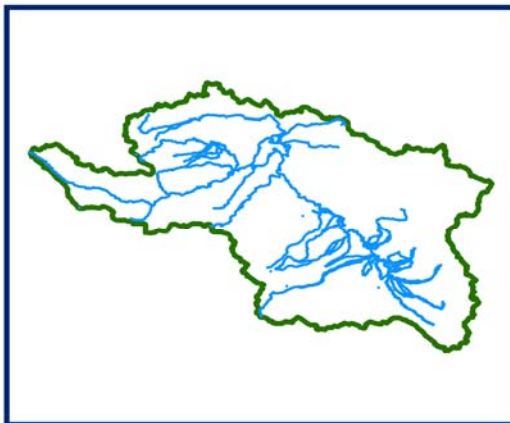
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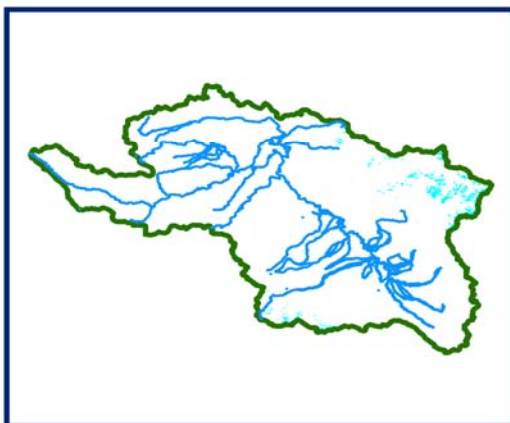
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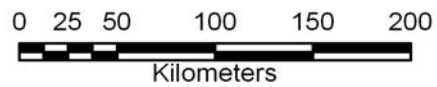
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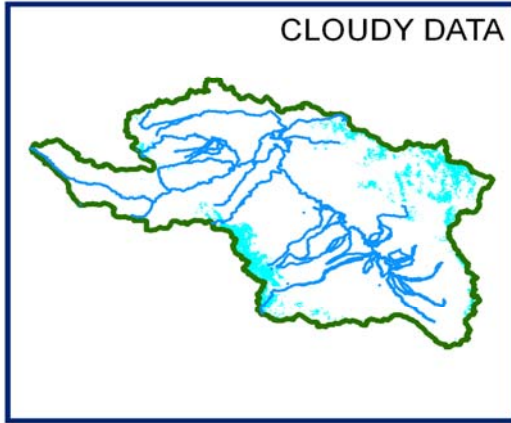


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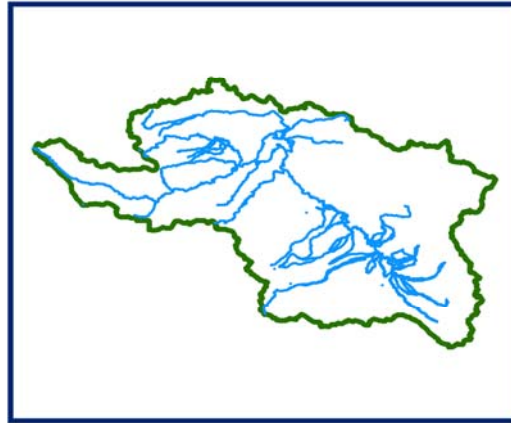


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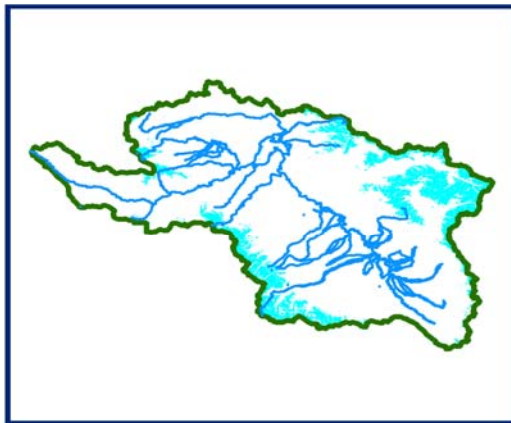
JHELUM BASIN



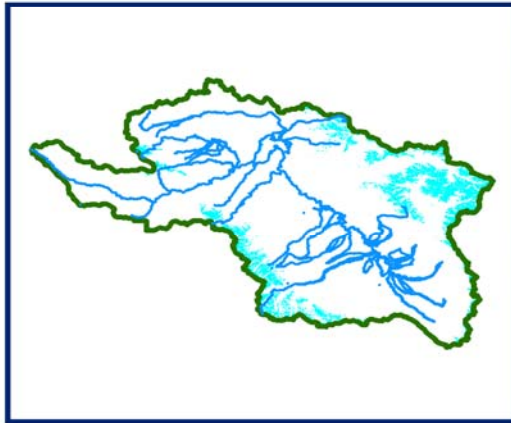
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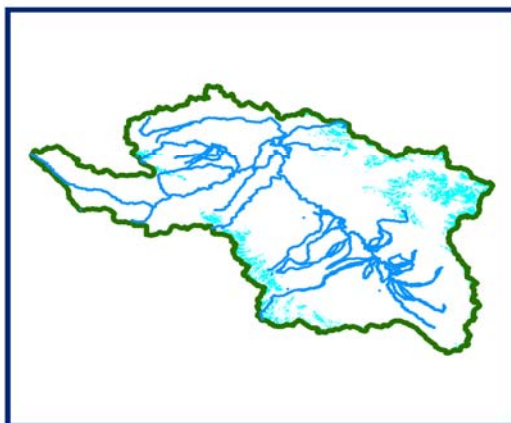
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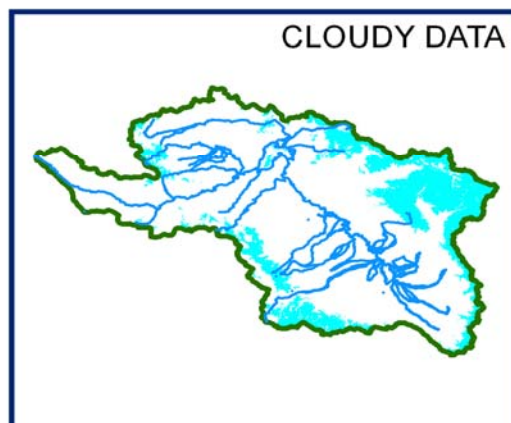
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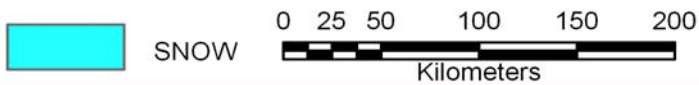
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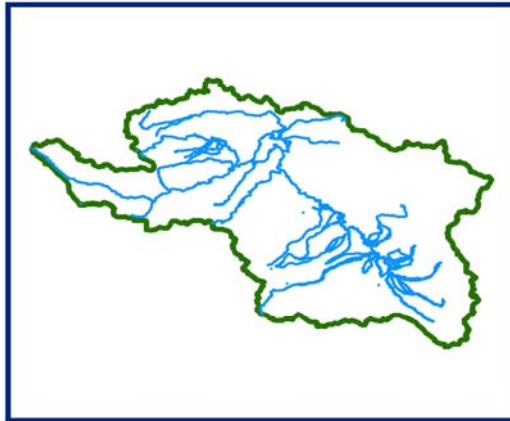
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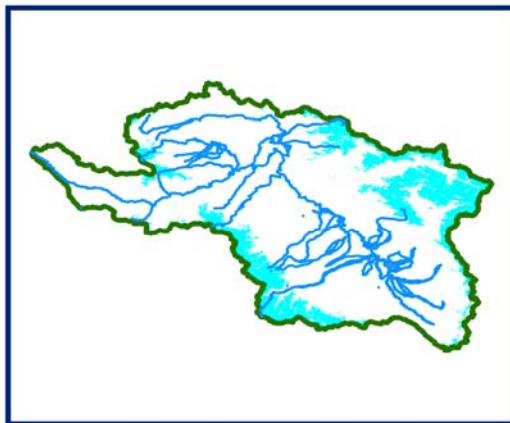
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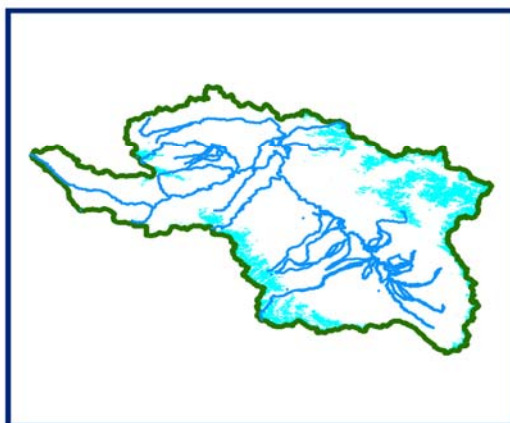
10 DAILY SNOW COVER MAP: JHELUM BASIN



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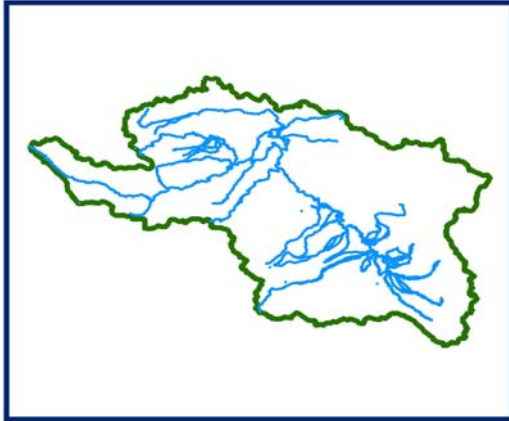


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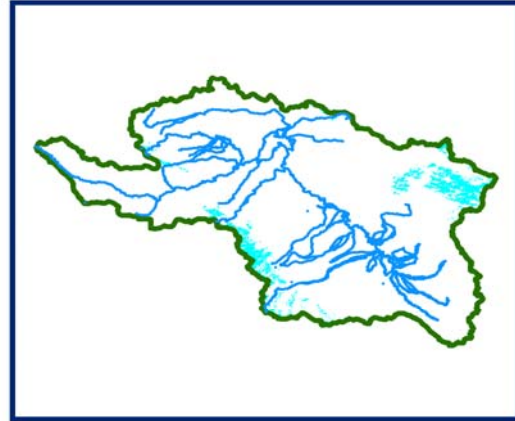


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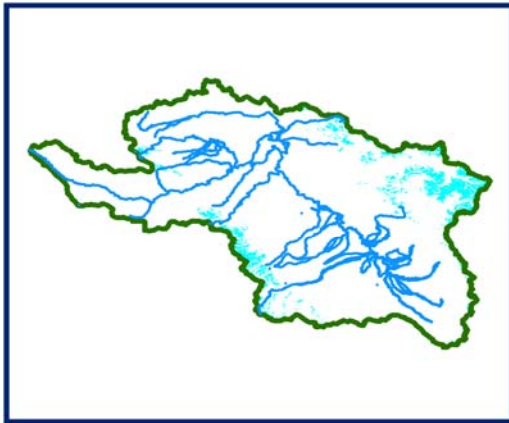
JHELUM BASIN



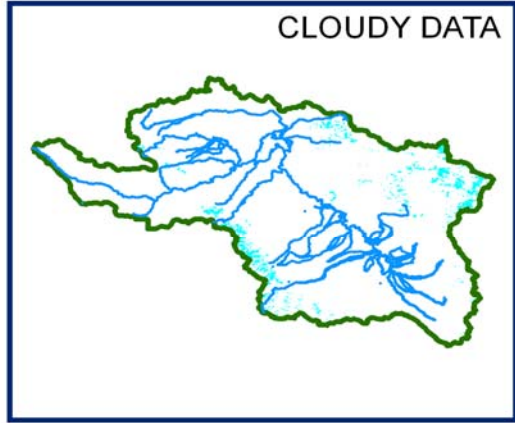
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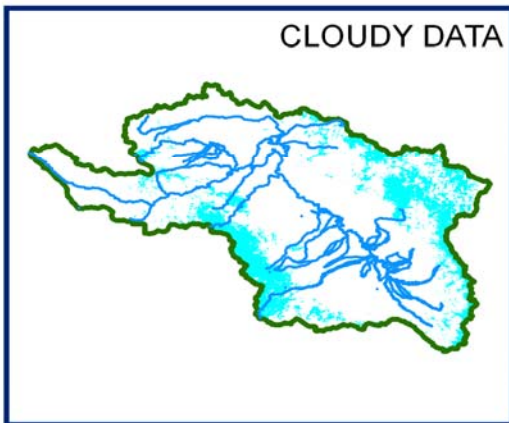
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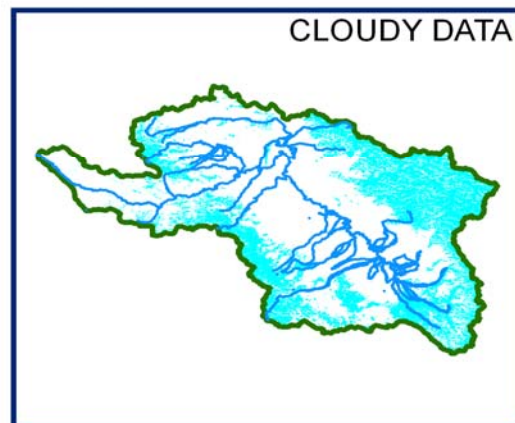
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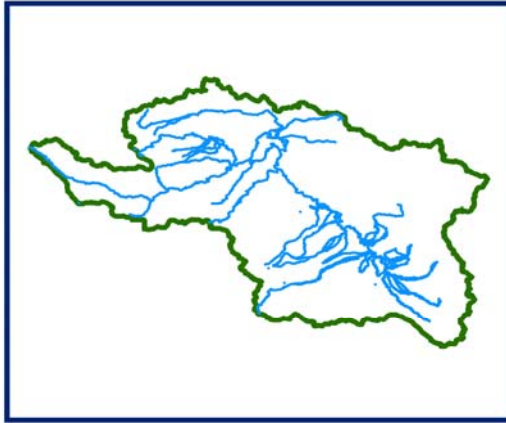
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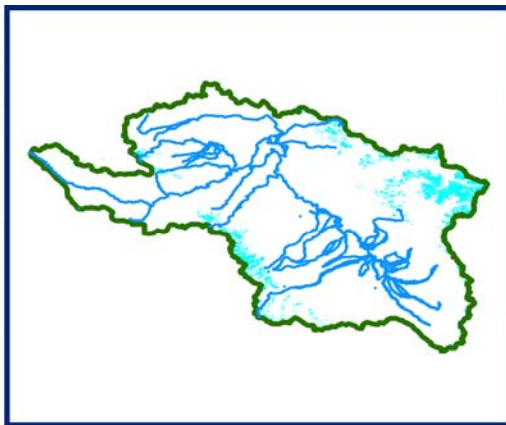
SNOW



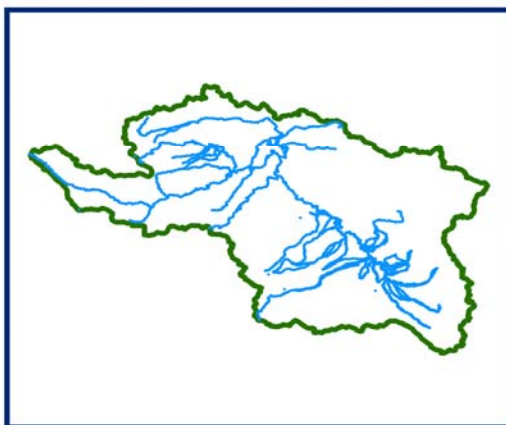
10 DAILY SNOW COVER MAP: JHELUM BASIN



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SNOW

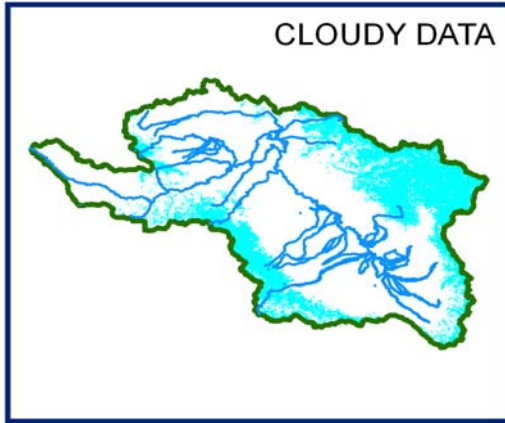
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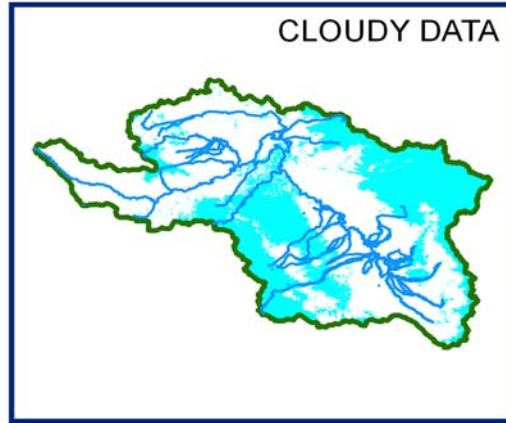
Kilometers

SNOW COVER MAP:

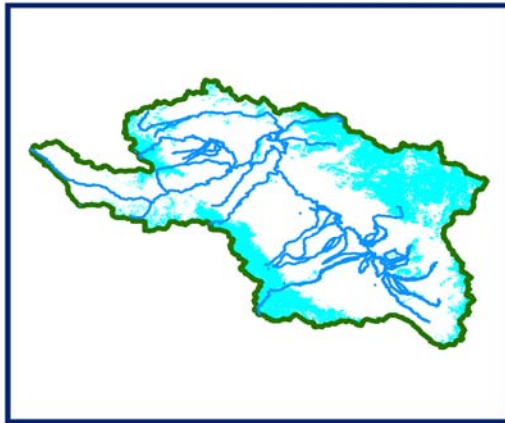
JHELUM BASIN



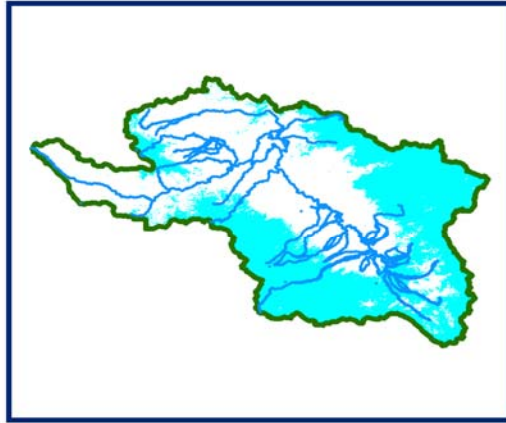
03 JANUARY 2014



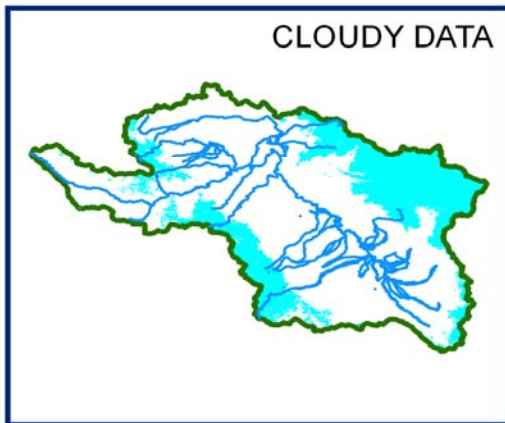
07 JANUARY 2014



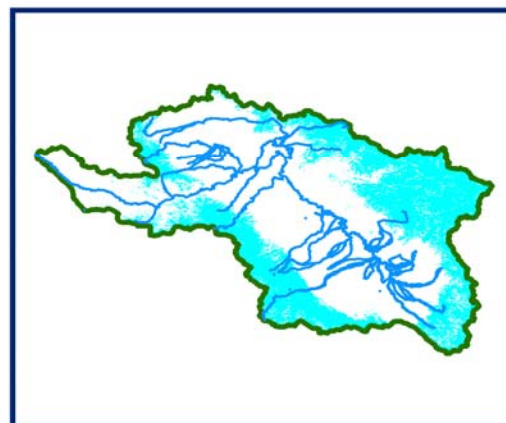
15 JANUARY 2014



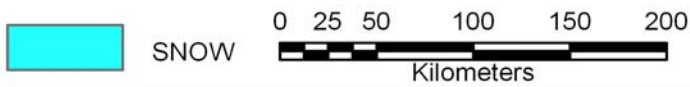
20 JANUARY 2014



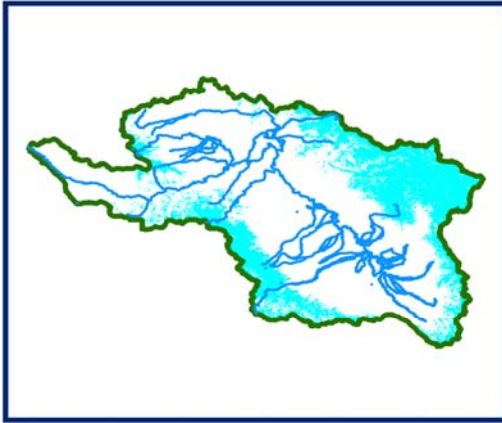
24 JANUARY 2014



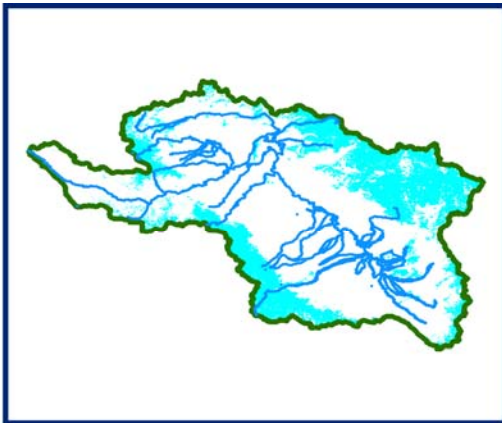
29 JANUARY 2014



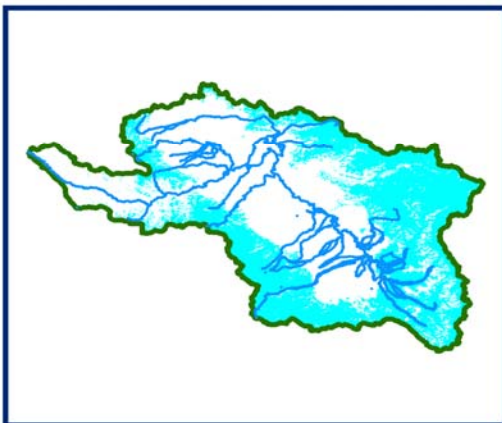
10 DAILY SNOW COVER MAP: JHELUM BASIN



**DATA USED
03 JANUARY 2014**



**DATA USED
15 JANUARY 2014**



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

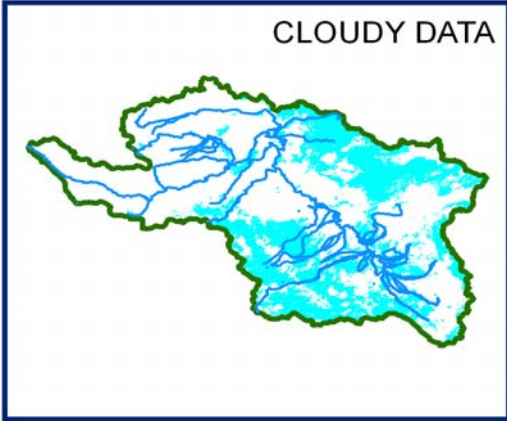


SNOW

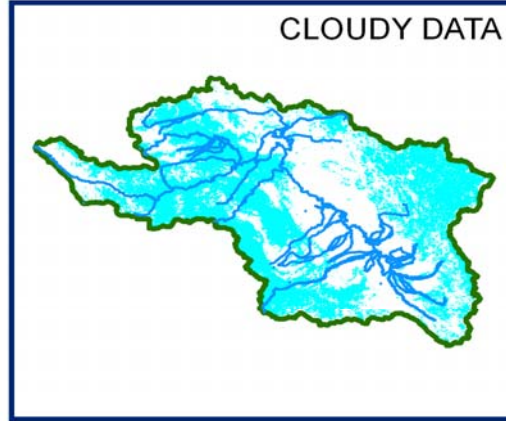


SNOW COVER MAP:

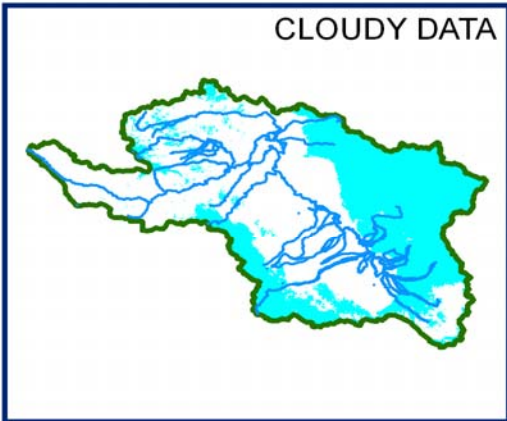
JHELUM BASIN



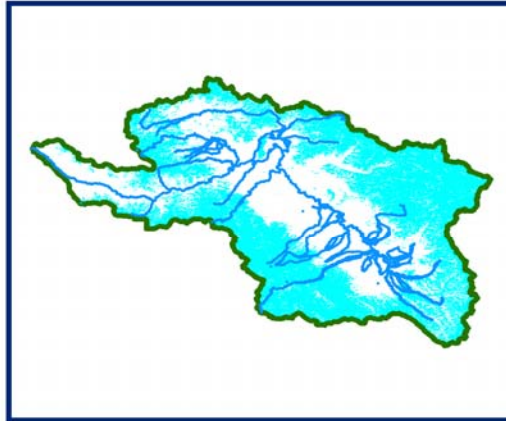
01 FEBRUARY 2014



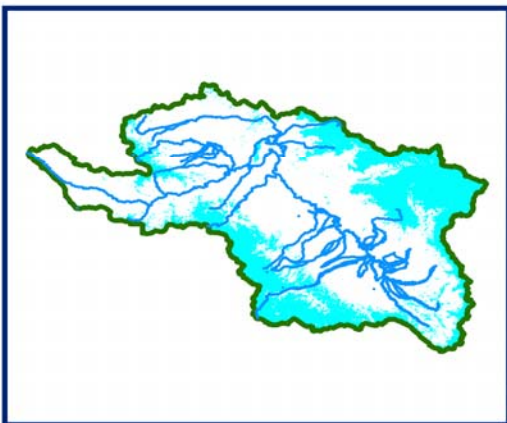
08 FEBRUARY 2014



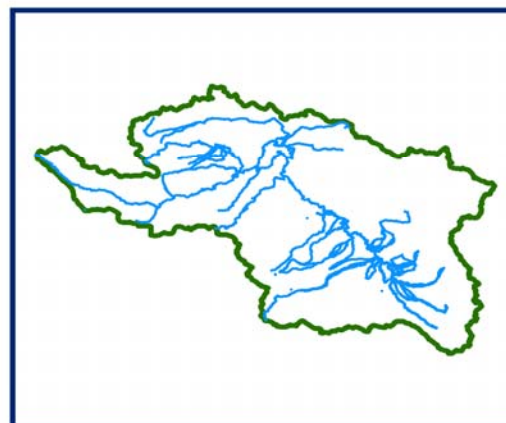
15 FEBRUARY 2014



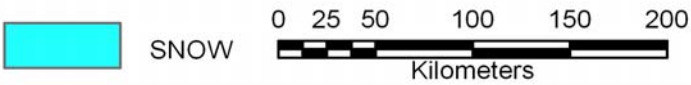
17 FEBRUARY 2014



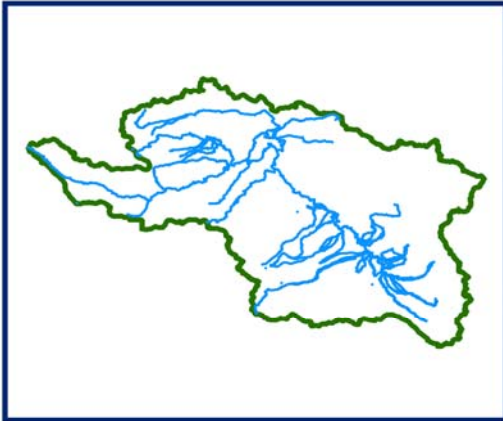
25 FEBRUARY 2014



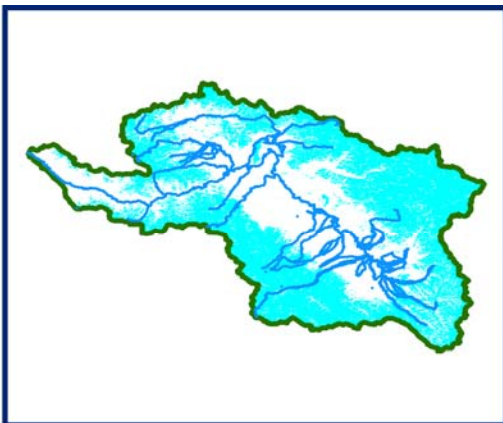
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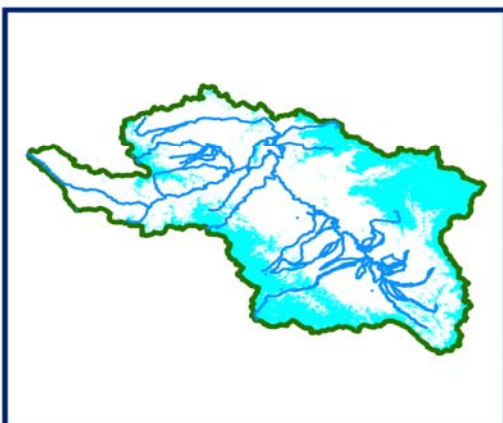
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
17 FEBRUARY 2014



DATA USED
25 FEBRUARY 2014

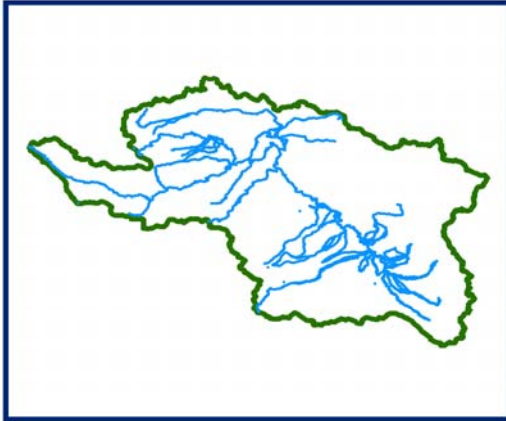


SNOW

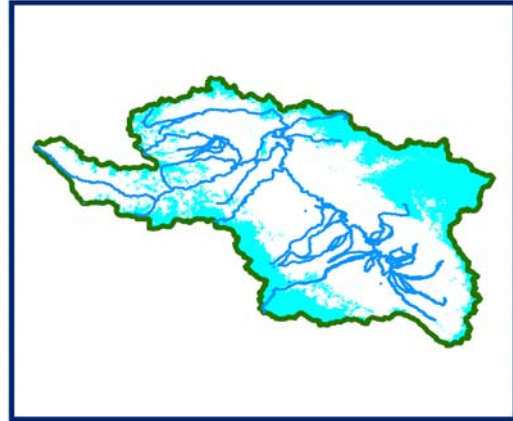


SNOW COVER MAP:

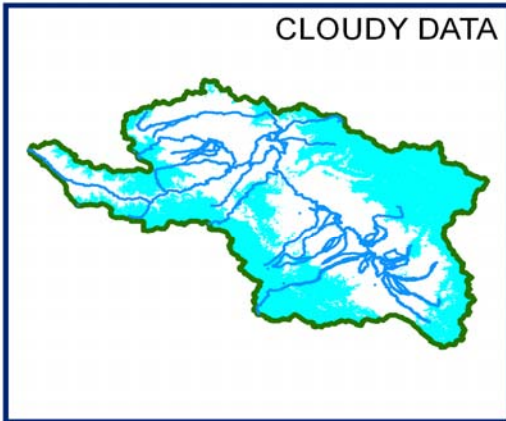
JHELUM BASIN



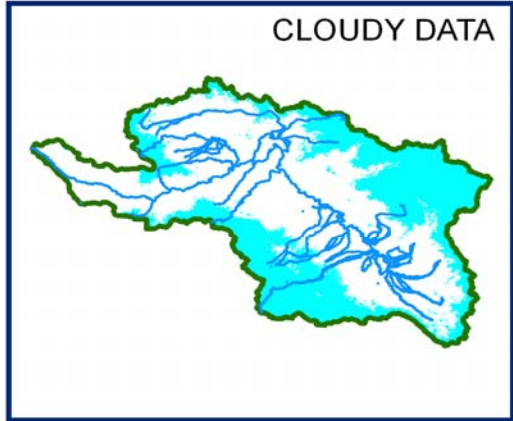
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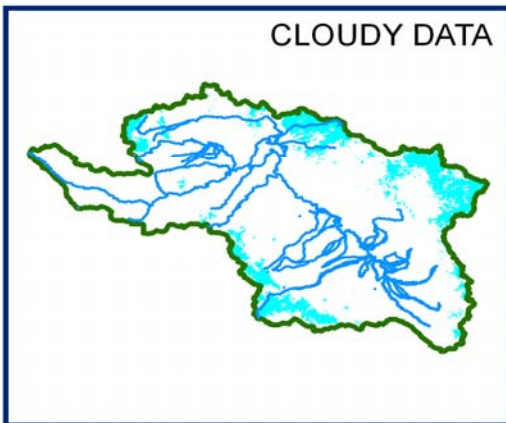
06 MARCH 2014



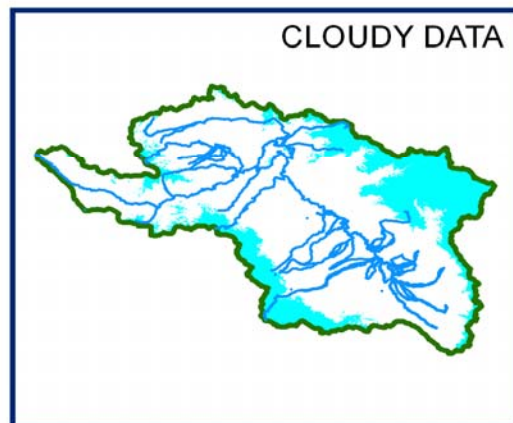
13 MARCH 2014



20 MARCH 2014



25 MARCH 2014



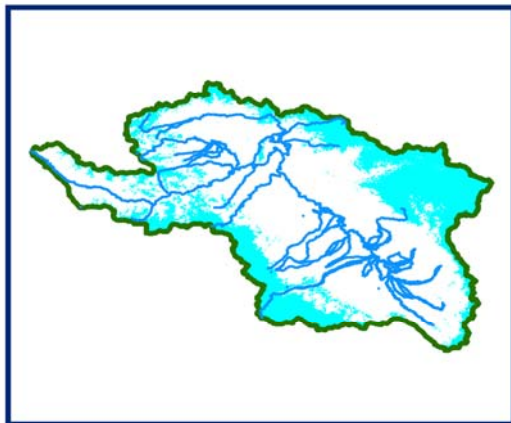
30 MARCH 2014



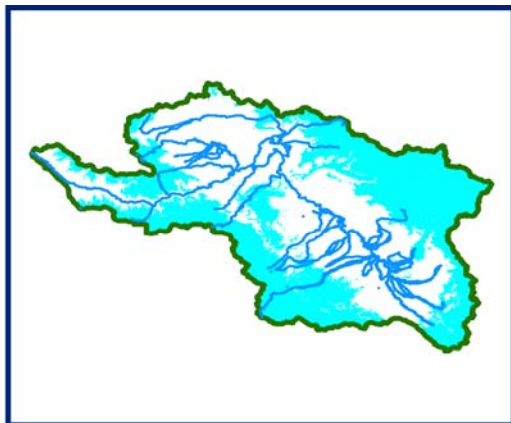
SNOW



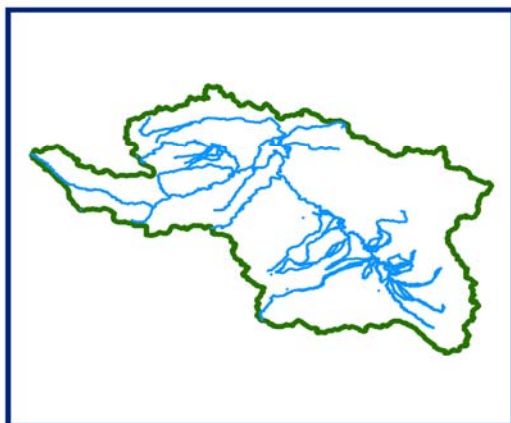
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
06 MARCH 2014



DATA USED
13 MARCH 2014



DATA USED
DATA NOT AVAILABLE

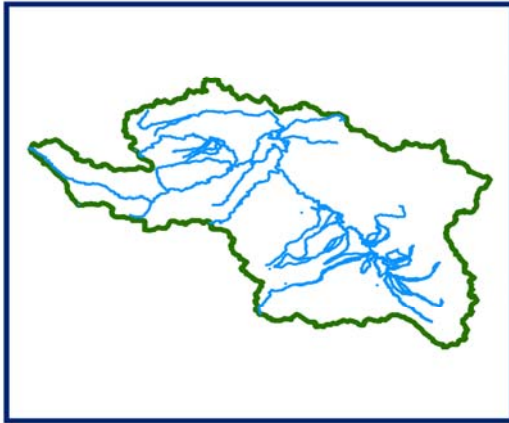


SNOW

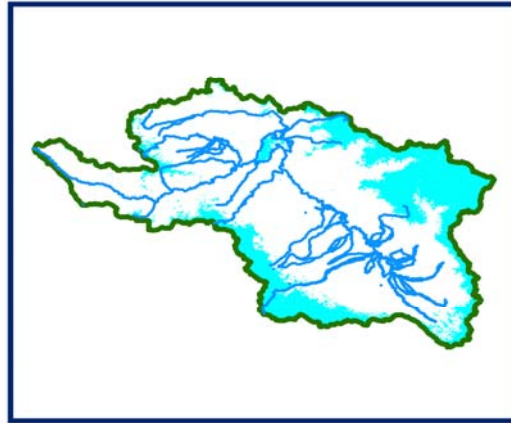


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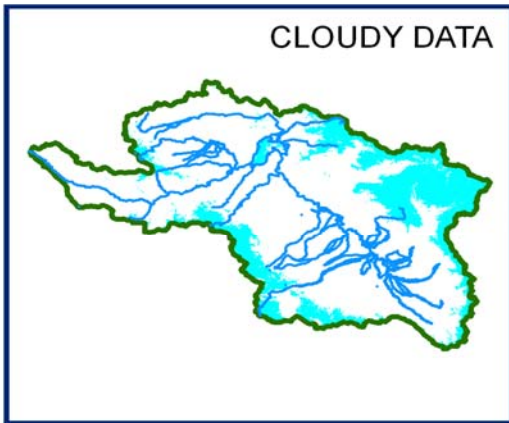
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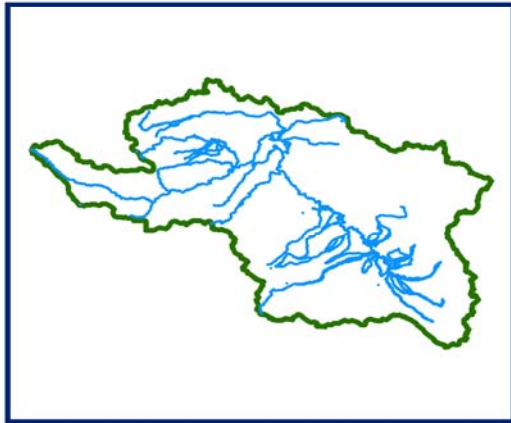
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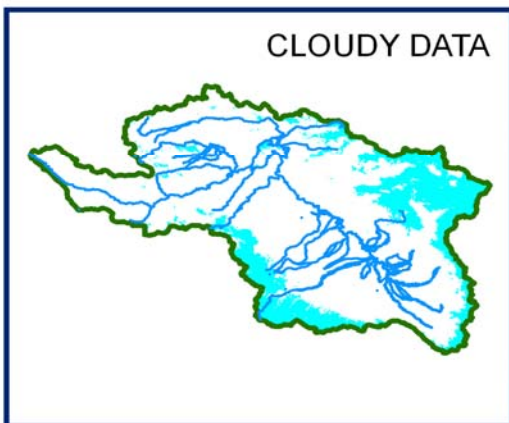
09 APRIL 2014



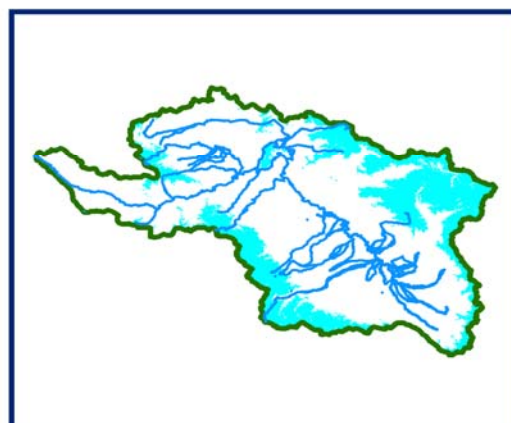
14 APRIL 2014



DATA NOT AVAILABLE



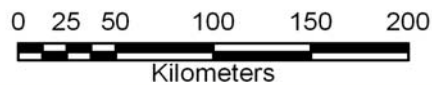
23 APRIL 2014



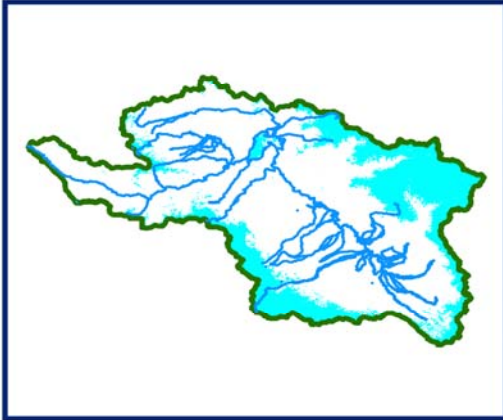
28 APRIL 2014



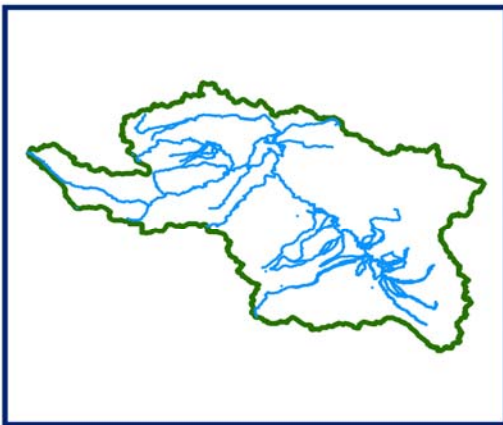
SNOW



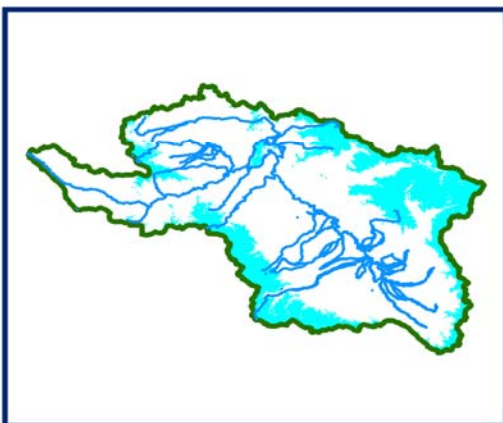
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
09 APRIL 2014



DATA USED
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DATA USED
28 APRIL 2014

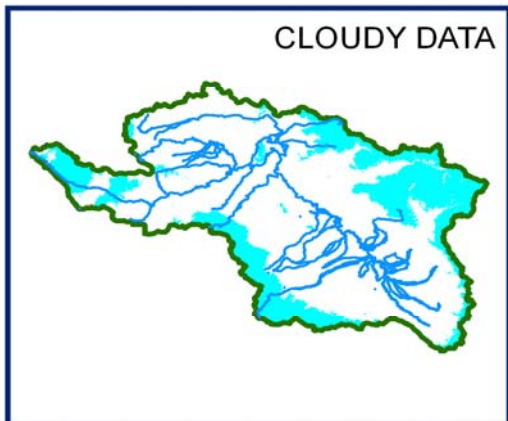


SNOW

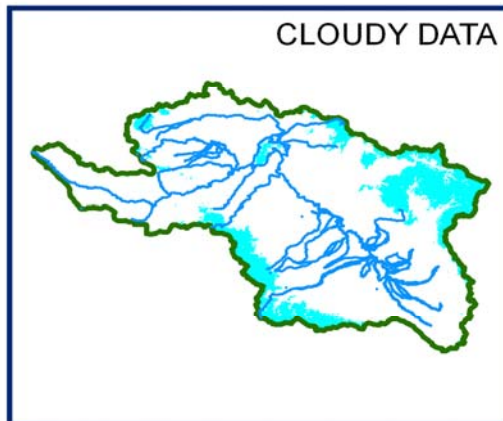


SNOW COVER MAP:

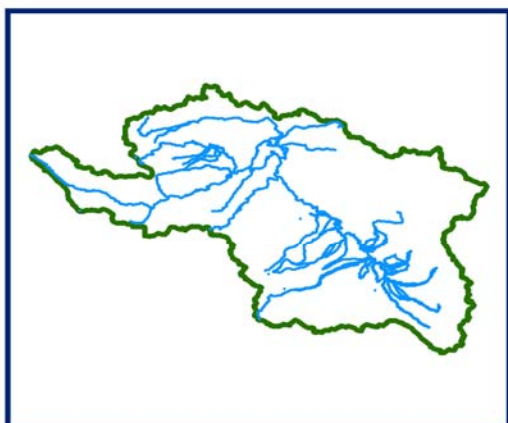
JHELUM BASIN



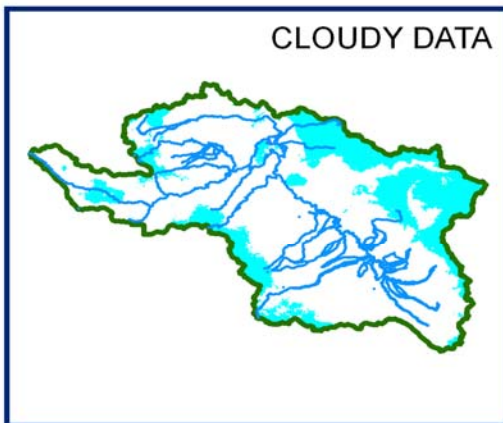
03 MAY 2014



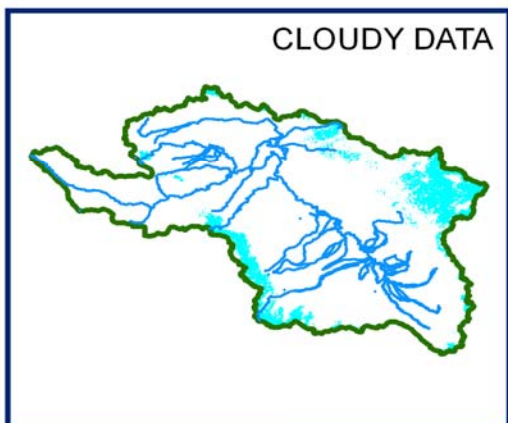
07 MAY 2014



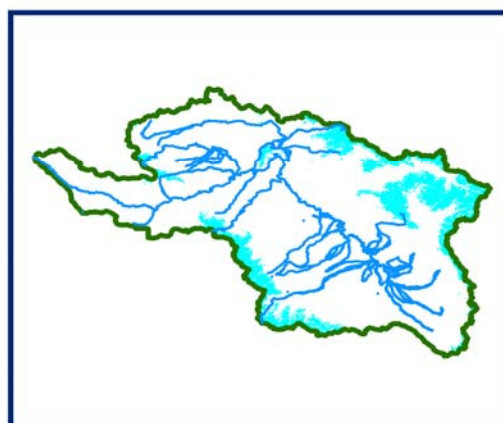
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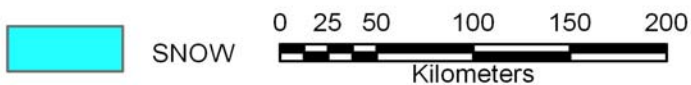
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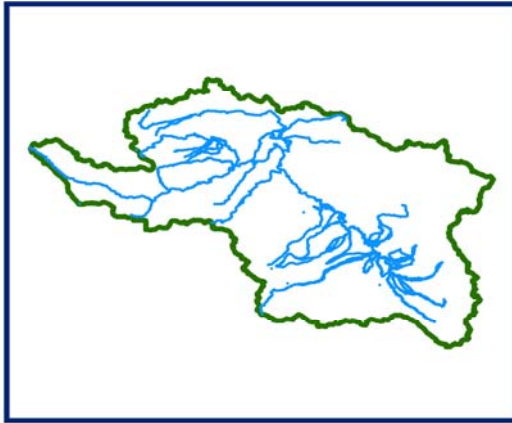
22 MAY 2014



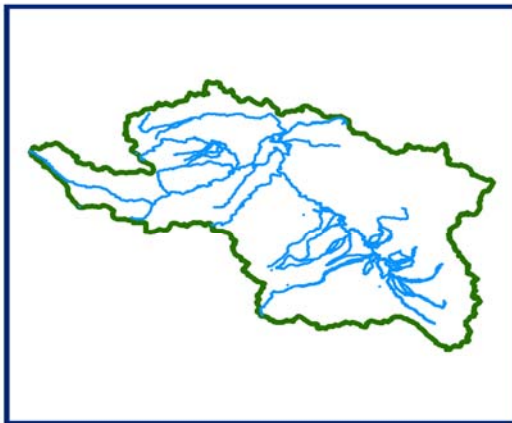
27 MAY 2014



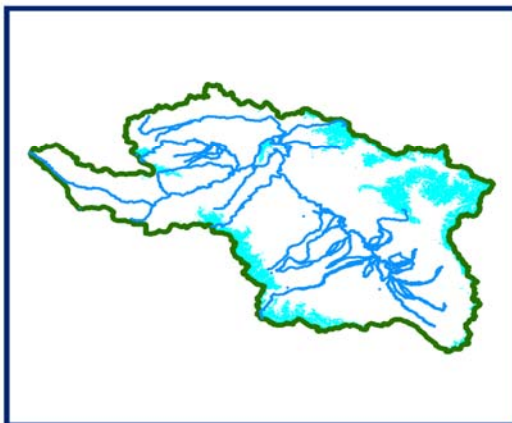
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
DATA NOT AVAILABLE



DATA USED
27 MAY 2014

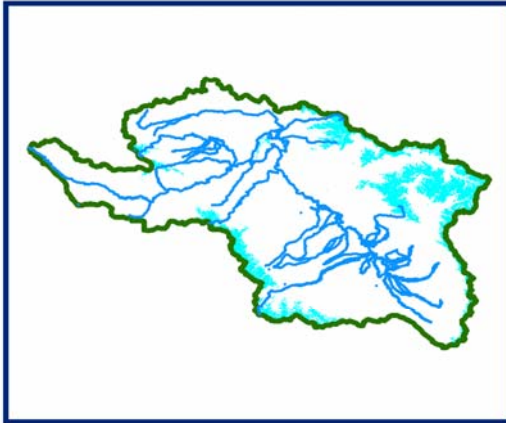


SNOW

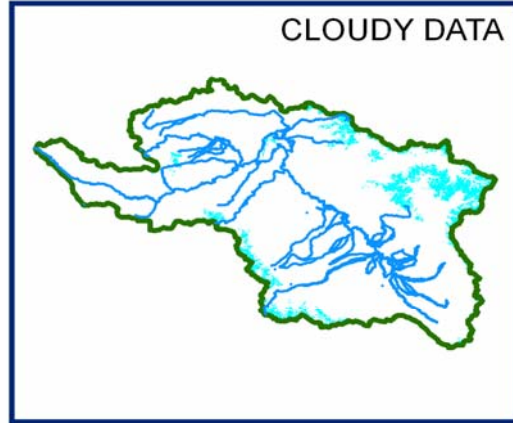


SNOW COVER MAP:

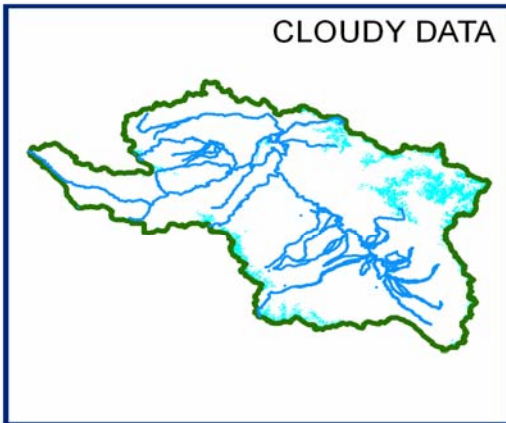
JHELUM BASIN



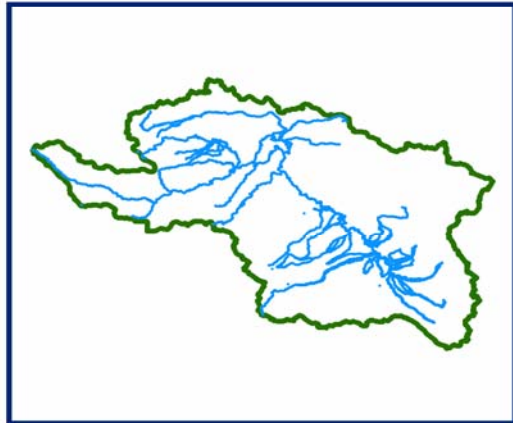
05 JUNE 2014



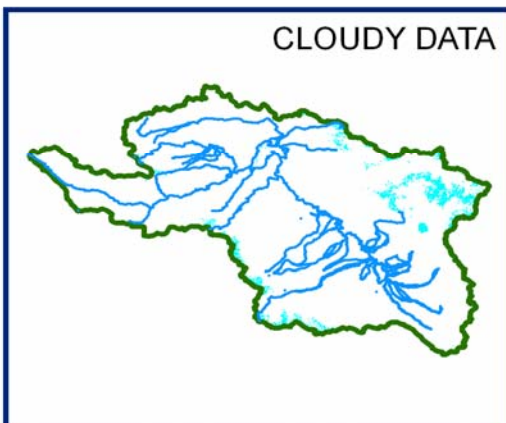
10 JUNE 2014



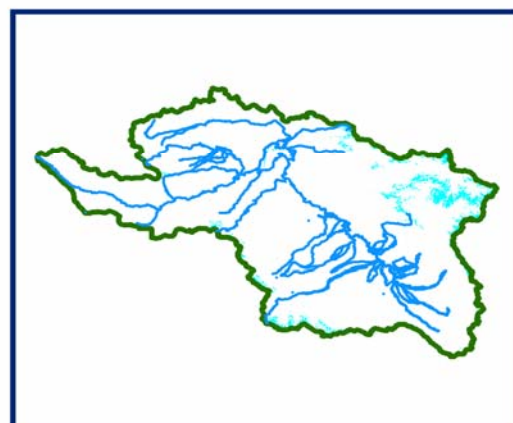
15 JUNE 2014



DATA NOT AVAILABLE



24 JUNE 2014



27 JUNE 2014



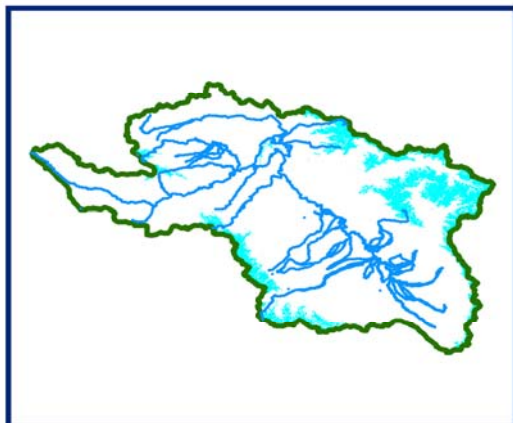
SNOW

0 25 50 100 150 200

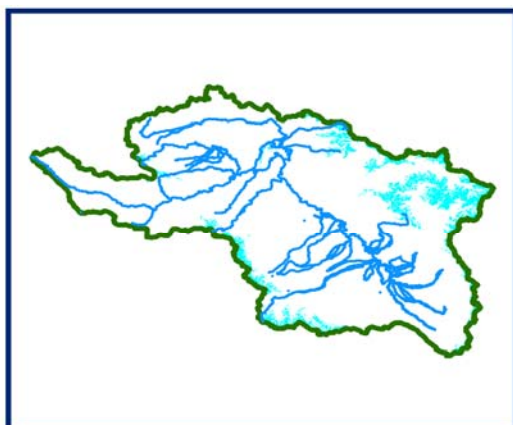


Kilometers

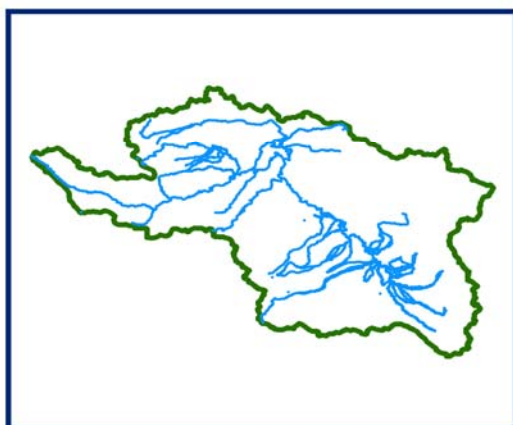
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
05 JUNE 2014



DATA USED
15 JUNE 2014

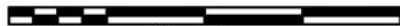


DATA USED
DATA NOT AVAILABLE



SNOW

0 25 50 100 150 200



Kilometers

KISAN GANGA BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: KISANGANGA

BASIN AREA: 7451sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	3-Oct-13	78	1	5	18-Oct-13	960	13
2	6-Oct-13	101	1	6	20-Oct-13	763	10
3	11-Oct-13	56	1	7	23-Oct-13	234	3
4	15-Oct-13	1068	14	8	25-Oct-13	479	6
November 2013							
9	1-Nov-14	2568	34	13	20-Nov-14	2665	36
10	11-Nov-14	3613	48	14	25-Nov-14	2295	31
11	15-Nov-14	3225	43	15	30-Nov-14	2087	28
12	16-Nov-14	2978	40				
December 2013							
16	10-Dec-14	1699	23	19	17-Dec-14	1937	26
17	12-Dec-14	4606	62	20	24-Dec-14	3372	45
18	15-Dec-14	2657	36	21	26-Dec-14	4986	67
January 2014							
22	2-Jan-14	5878	79	28	24-Jan-14	4948	66
23	3-Jan-14	4132	55	29	26-Jan-14	5738	77
24	5-Jan-14	4869	65	30	27-Jan-14	5647	76
25	7-Jan-14	5423	73	31	29-Jan-14	5970	80
26	15-Jan-14	6154	83	32	31-Jan-14	4674	63
27	17-Jan-14	4619	62				
February 2014							
33	8-Feb-14	6033	81	36	17-Feb-14	6627	89
34	10-Feb-14	6323	85	37	20-Feb-14	5511	74
35	15-Feb-14	5679	76	38	24-Feb-14	5882	79
March 2014							
39	6-Mar-14	6597	89	43	23-Mar-14	6315	85
40	13-Mar-14	6909	93	44	25-Mar-14	5424	73
41	16-Mar-14	3098	42	45	30-Mar-14	5993	80
42	20-Mar-14	6117	82				
April 2014							
46	9-Apr-14	5540	74	49	23-Apr-14	3858	52
47	13-Apr-14	3778	51	50	28-Apr-14	4960	67
48	21-Apr-14	5582	75	51	30-Apr-14	5071	68

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
May 2014							
52	3-May-14	5608	75	56	22-May-14	4195	56
53	7-May-14	3619	49	57	24-May-14	3666	49
54	10-May-14	3531	47	58	26-May-14	2423	33
55	17-May-14	4712	63	59	27-May-14	3054	41
June 2014							
60	5-Jun-14	2837	38	63	24-Jun-14	1376	18
61	10-Jun-14	2126	29	64	27-Jun-14	1348	18
62	15-Jun-14	2035	27	65	29-Jun-14	1219	16

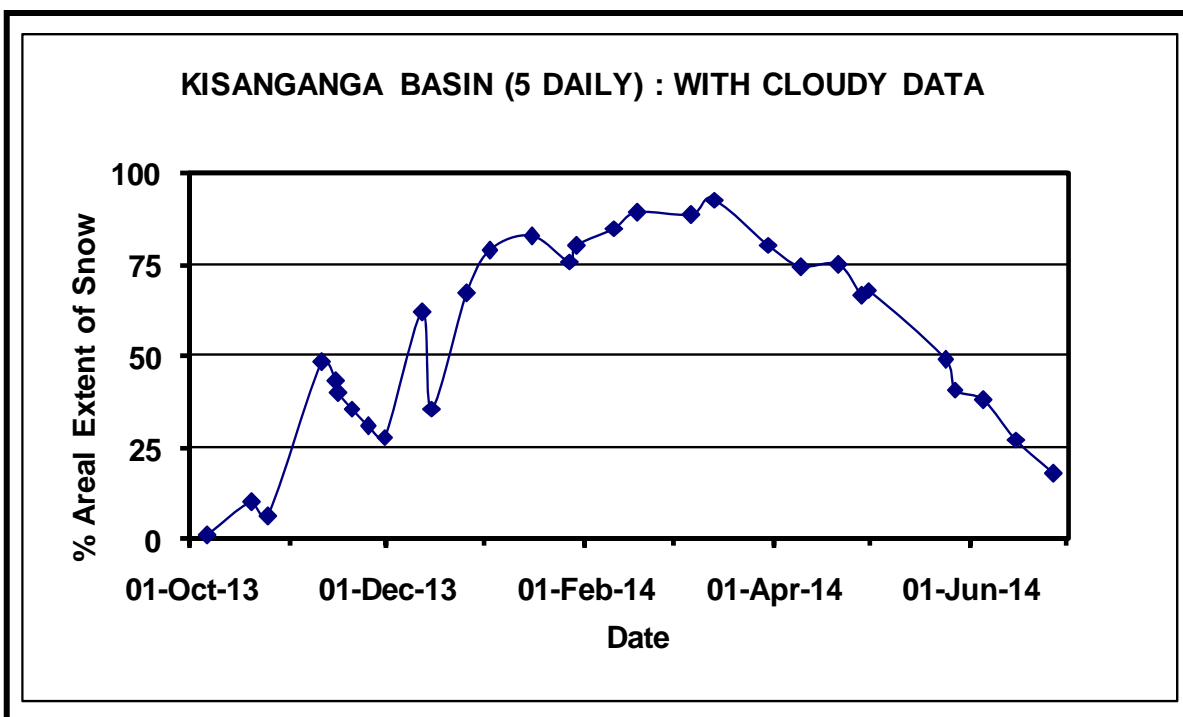
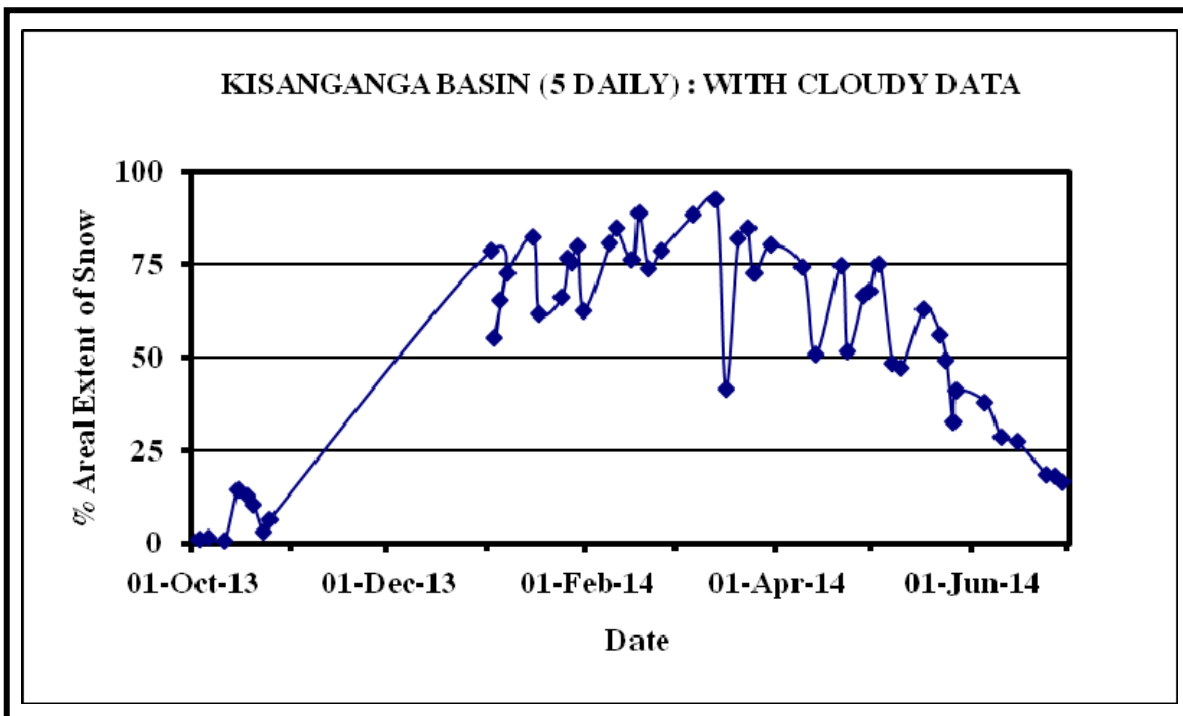
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: KISANGANGA

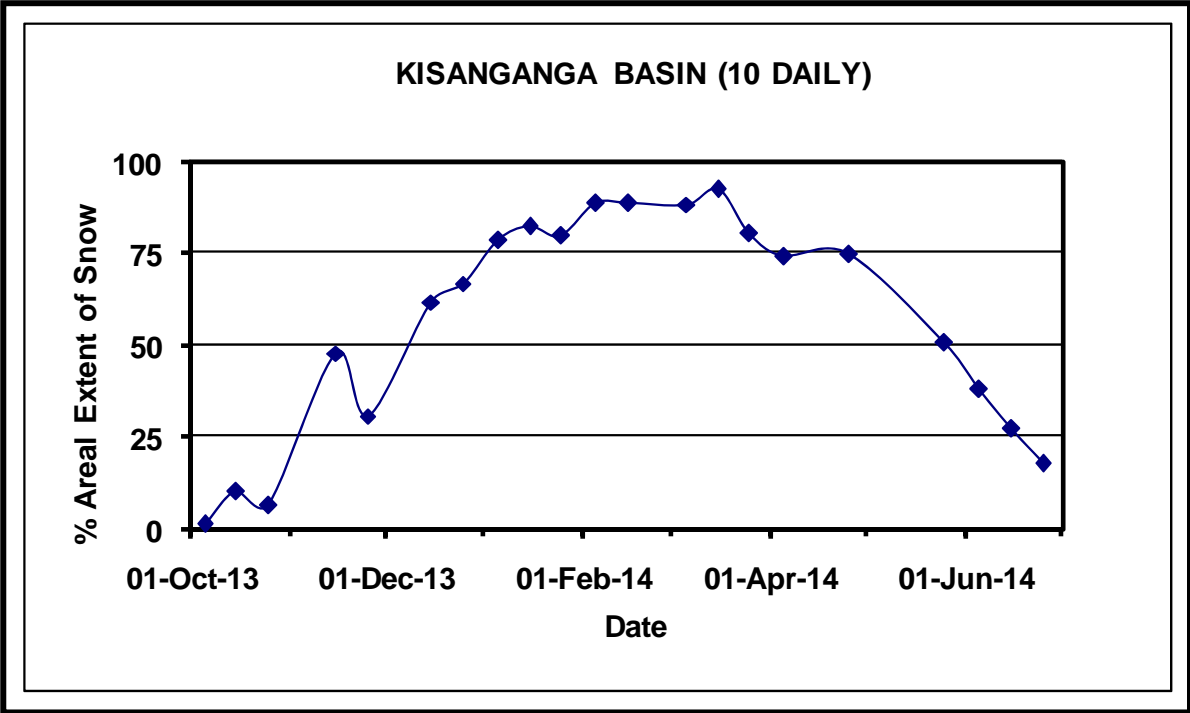
BASIN AREA: 7451 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	5-Oct-13	101	1	3	25-Oct-13	479	6
2	15-Oct-13	763	10				
November 2013							
4	15-Nov-13	3576	48	5	25-Nov-13	2310	31
December 2013							
6	15-Dec-13	4620	62	7	25-Dec-13	4986	67
January 2014							
8	5-Jan-14	5878	79	10	25-Jan-14	5961	80
9	15-Jan-14	6154	83				
February 2014							
11	5-Feb-14	6627	89	12	15-Feb-14	6627	89
March 2014							
13	5-Mar-14	6597	89	15	25-Mar-14	5993	80
14	15-Mar-14	6909	93				
April 2014							
16	5-Apr-14	5540	74	17	25-Apr-14	5588	75
May 2014							
18	25-May-14	3786	51				
June 2014							
19	5-Jun-14	2837	38	21	25-Jun-14	1348	18
20	15-Jun-14	2035	27				

Snow cover depletion curve



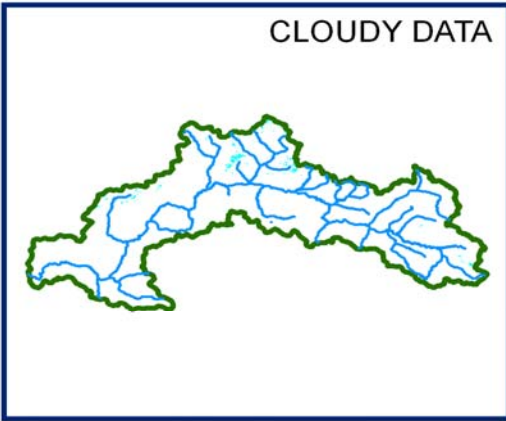
Snow cover depletion curve



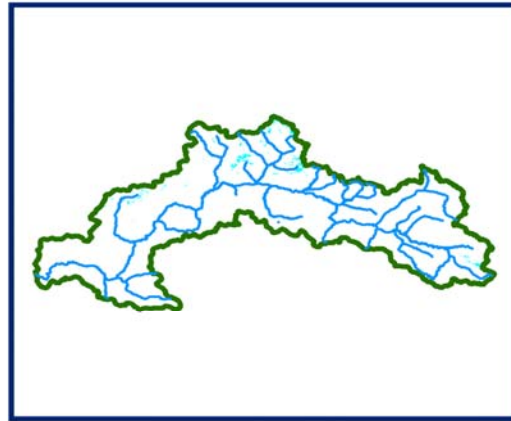
SNOW COVER MAP

SNOW COVER MAP:

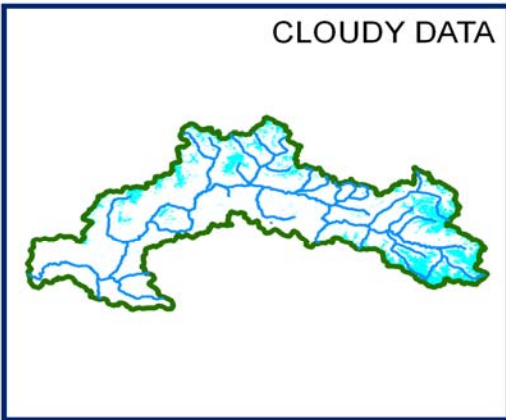
KISANGANGA BASIN



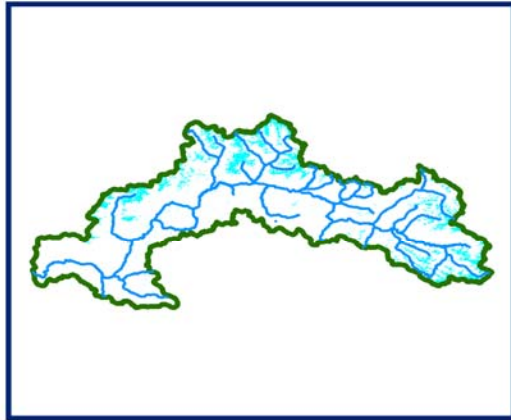
03 OCTOBER 2013



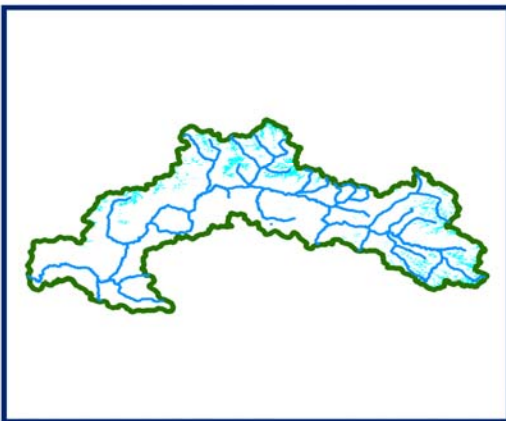
06 OCTOBER 2013



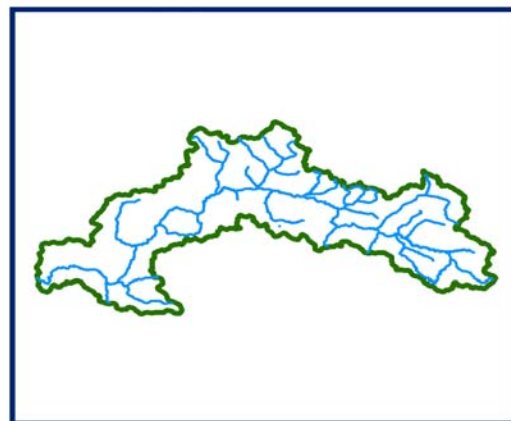
15 OCTOBER 2013



20 OCTOBER 2013



25 OCTOBER 2013



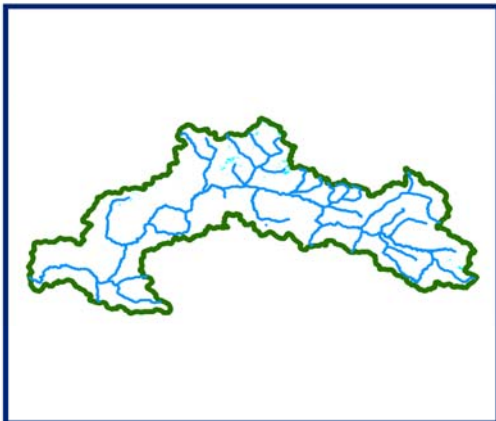
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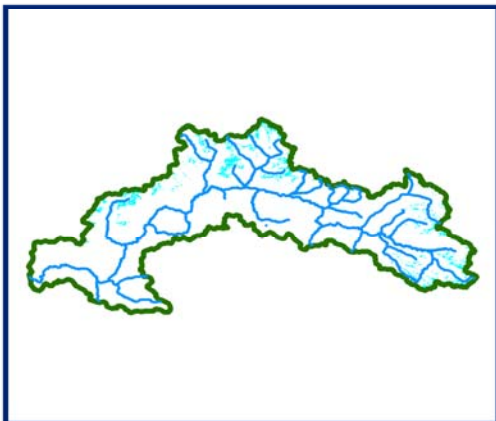
SNOW



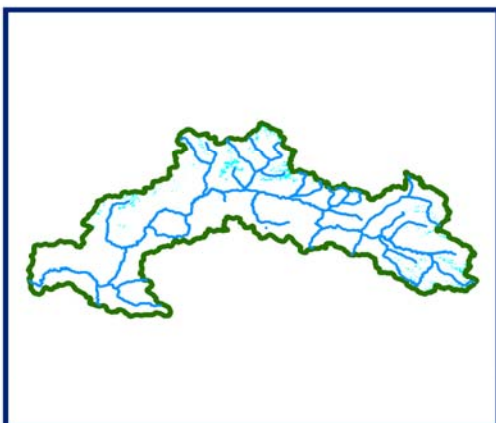
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



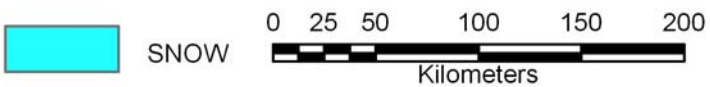
DATA USED
06 OCTOBER 2013



DATA USED
20 OCTOBER 2013

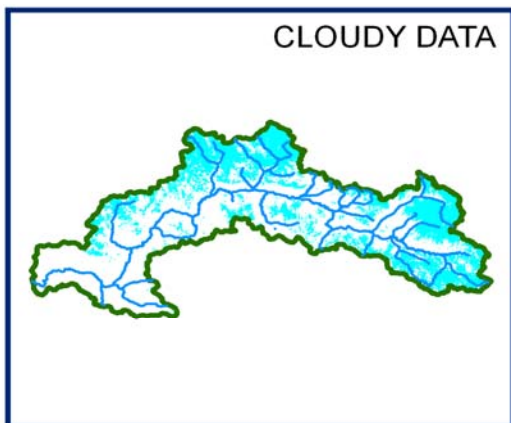


DATA USED
25 OCTOBER 2013

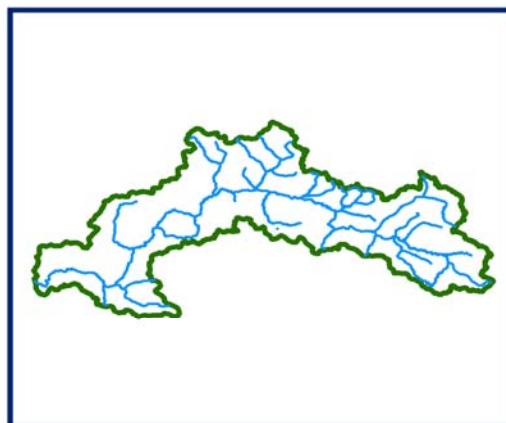


SNOW COVER MAP:

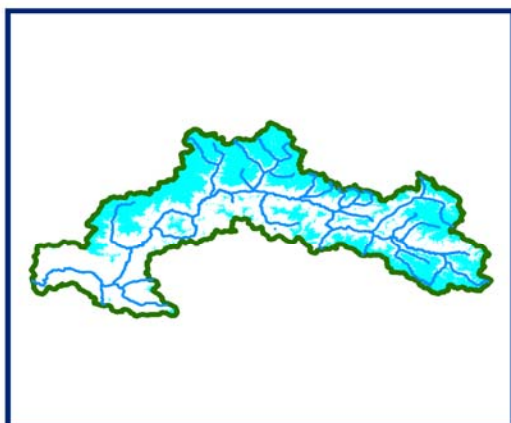
KISANGANGA BASIN



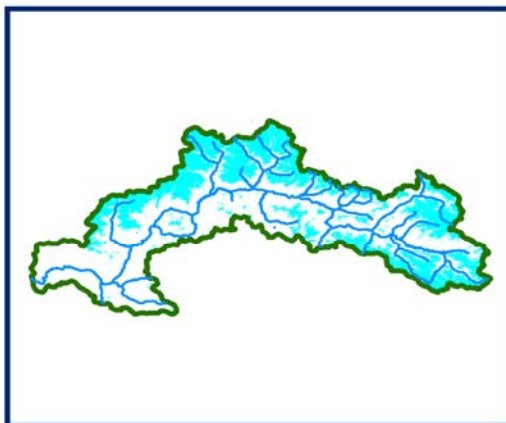
01 NOVEMBER 2013



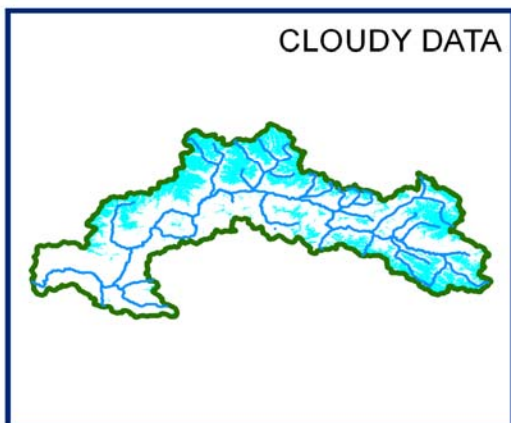
DATA NOT AVAILABLE



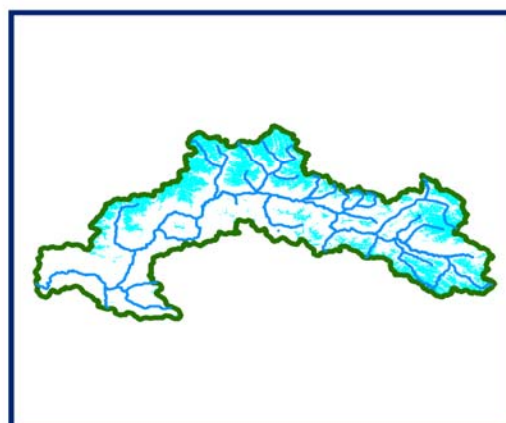
15 NOVEMBER 2013



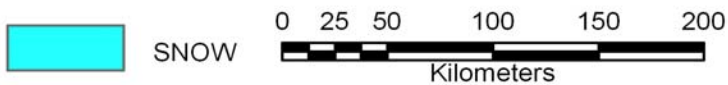
20 NOVEMBER 2013



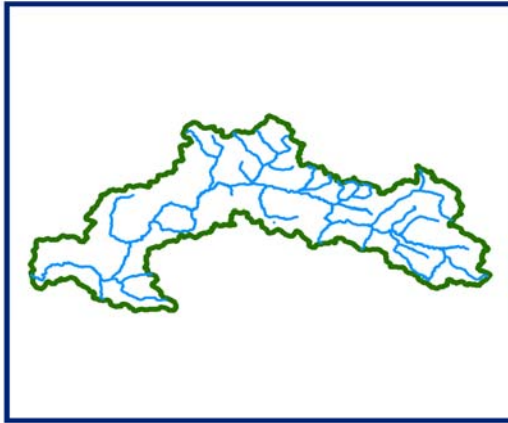
25 NOVEMBER 2013



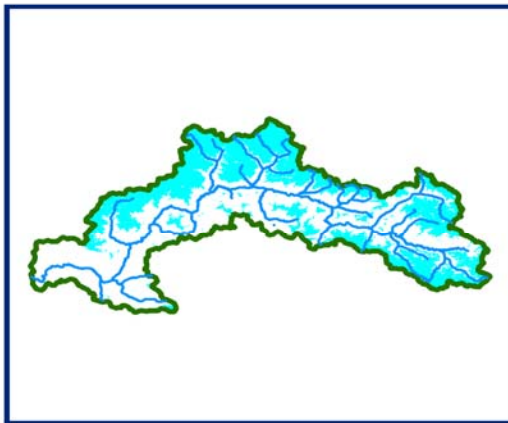
30 NOVEMBER 2013



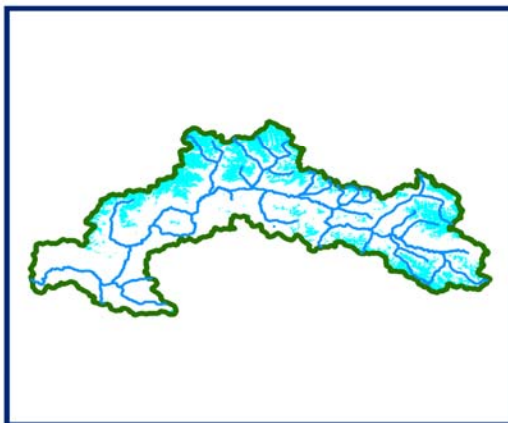
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



DATA USED
DATA NOT AVAILABLE



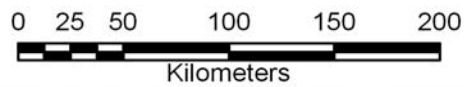
DATA USED
15 NOVEMBER 2013
16 NOVEMBER 2013
20 NOVEMBER 2013



DATA USED
25 NOVEMBER 2013
30 NOVEMBER 2013

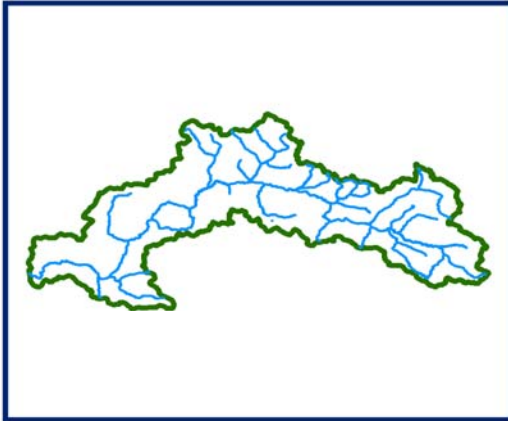


SNOW

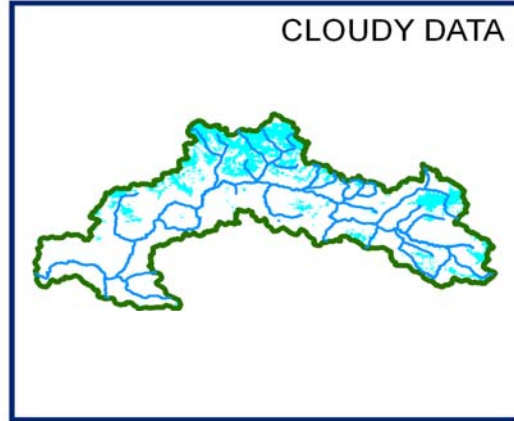


SNOW COVER MAP:

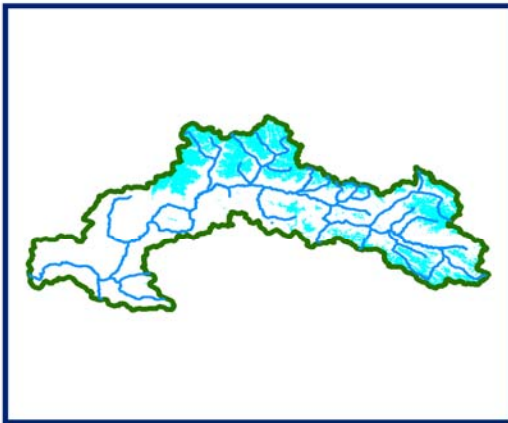
KISANGANGA BASIN



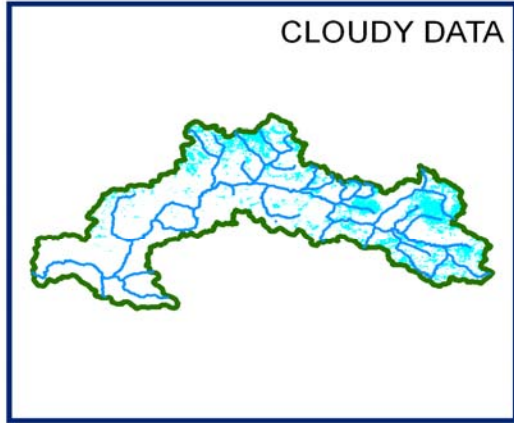
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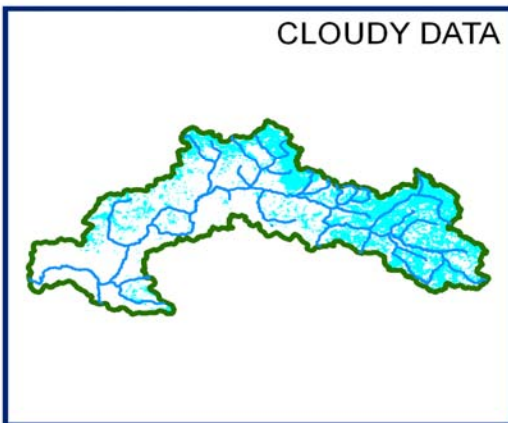
10 DECEMBER 2013



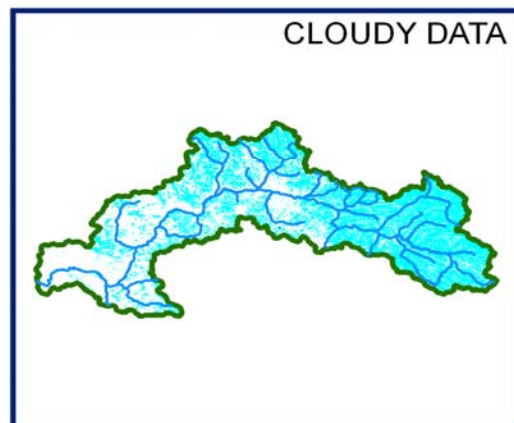
15 DECEMBER 2013



17 DECEMBER 2013



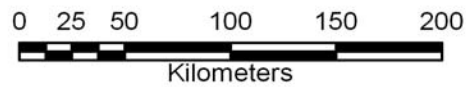
24 DECEMBER 2013



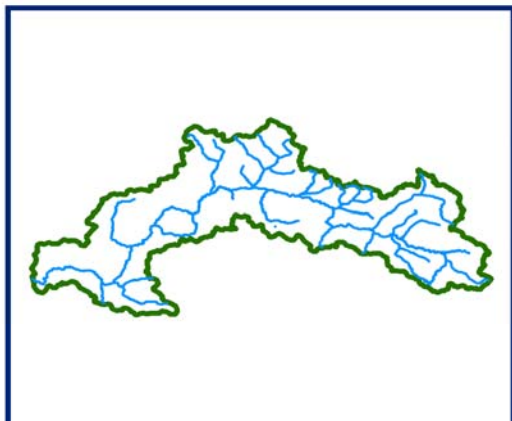
26 DECEMBER 2013



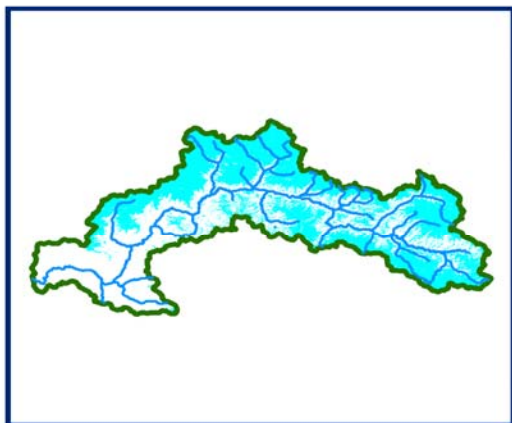
SNOW



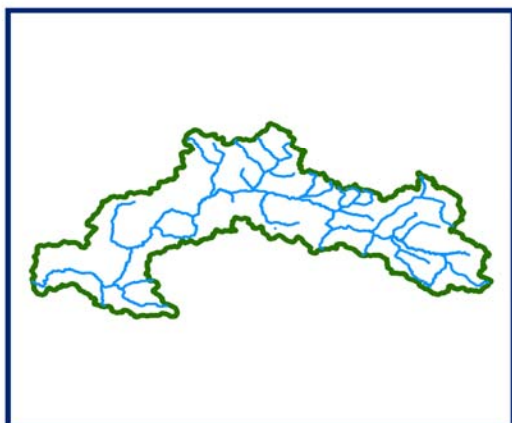
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
12 DECEMBER 2013
15 DECEMBER 2013



DATA USED
DATA NOT AVAILABLE

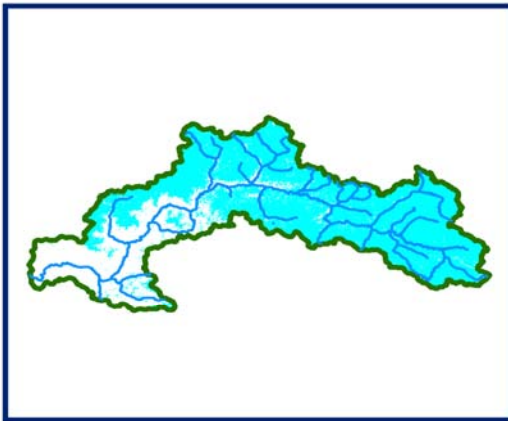


SNOW

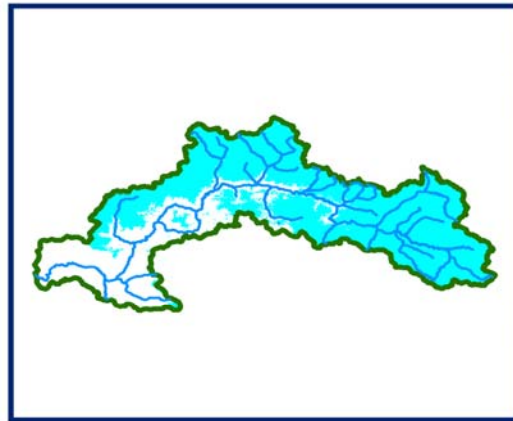


SNOW COVER MAP:

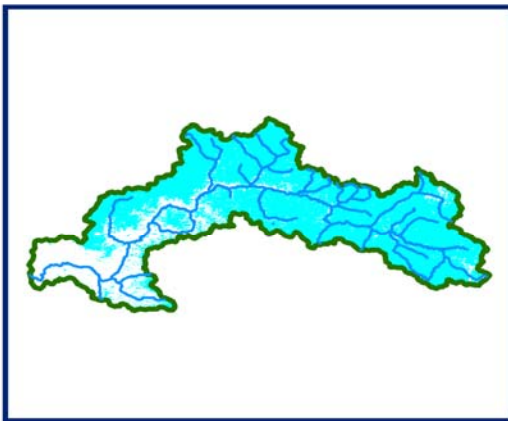
KISANGANGA BASIN



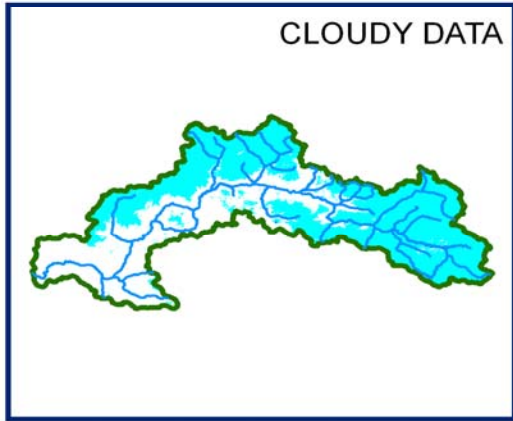
02 JANUARY 2014



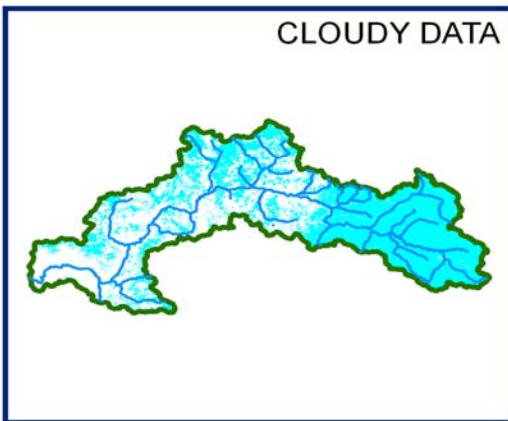
07 JANUARY 2014



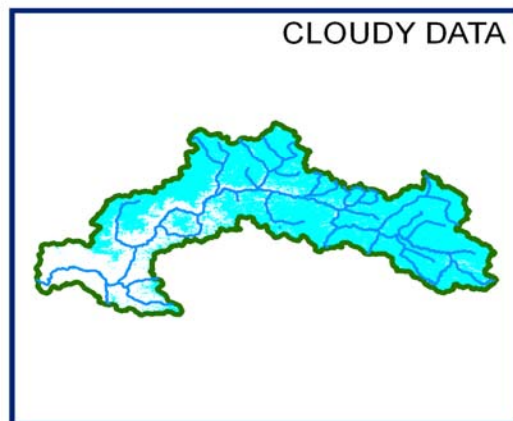
15 JANUARY 2014



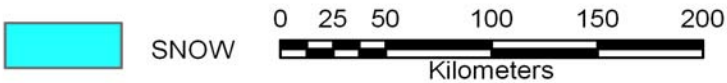
17 JANUARY 2014



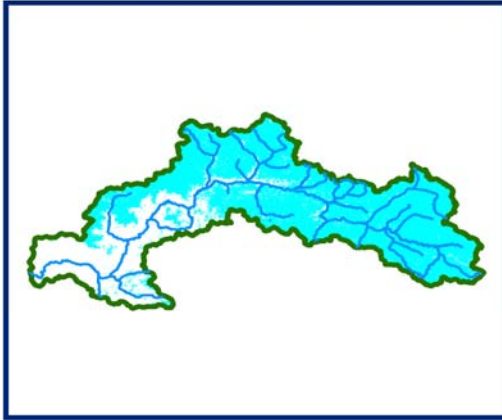
24 JANUARY 2014



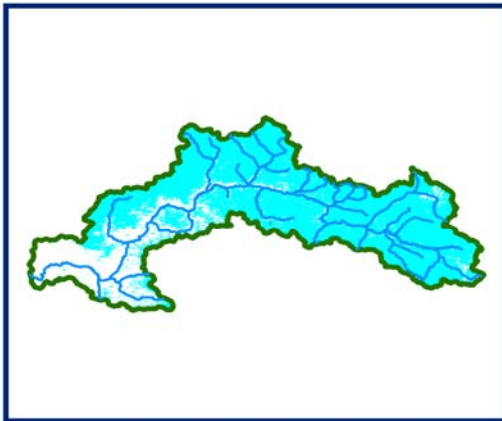
29 JANUARY 2014



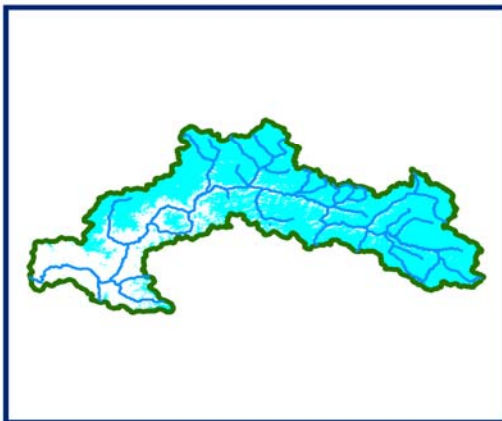
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



**DATA USED
02 JANUARY 2014**



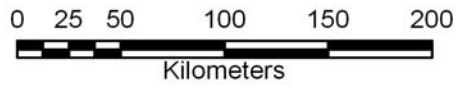
**DATA USED
15 JANUARY 2014**



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

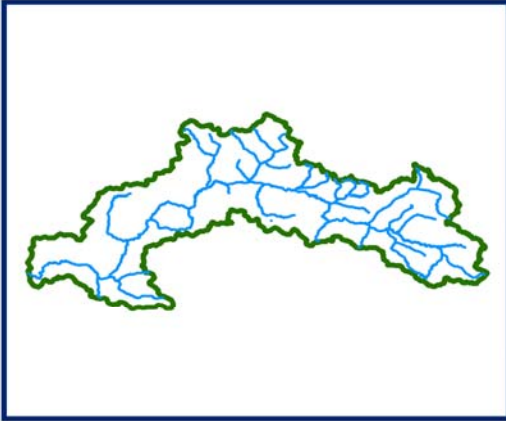


SNOW

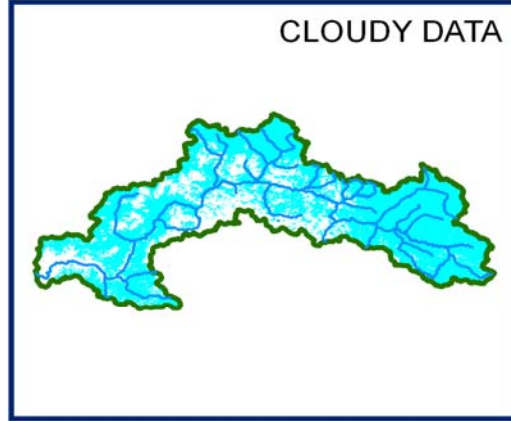


SNOW COVER MAP:

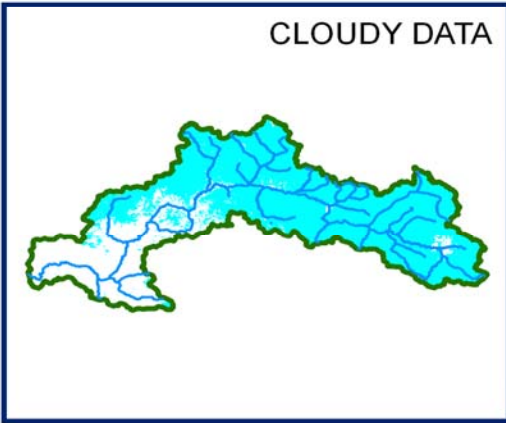
KISANGANGA BASIN



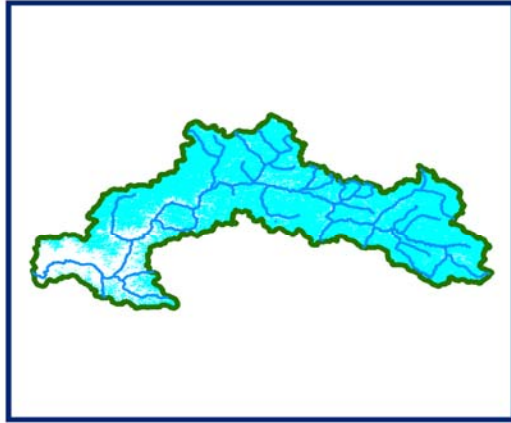
DATA NOT AVAILABLE



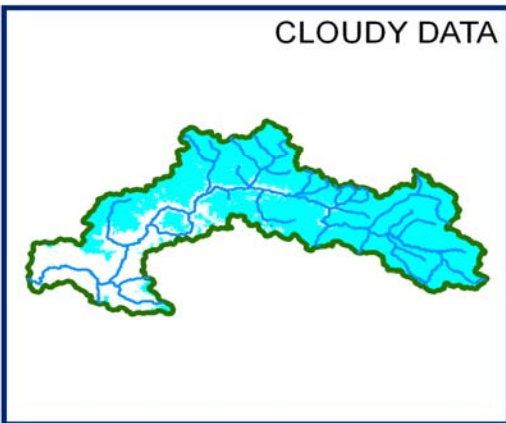
08 FEBRUARY 2014



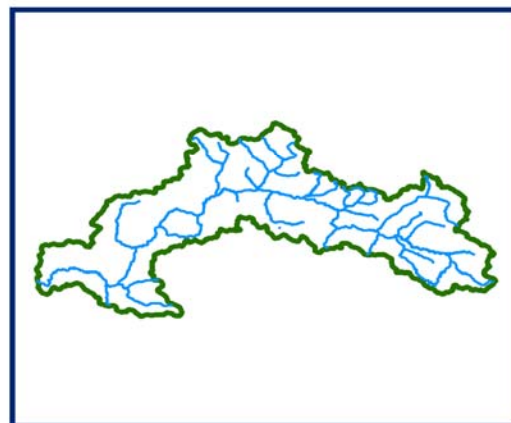
15 FEBRUARY 2014



17 JANUARY 2014



24 FEBRUARY 2014



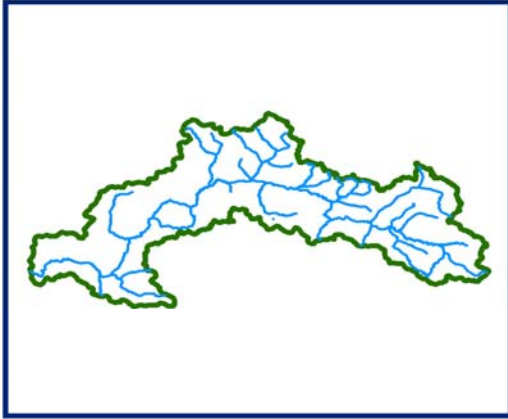
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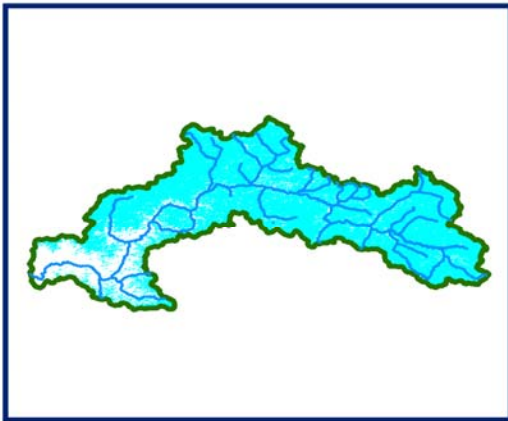
SNOW



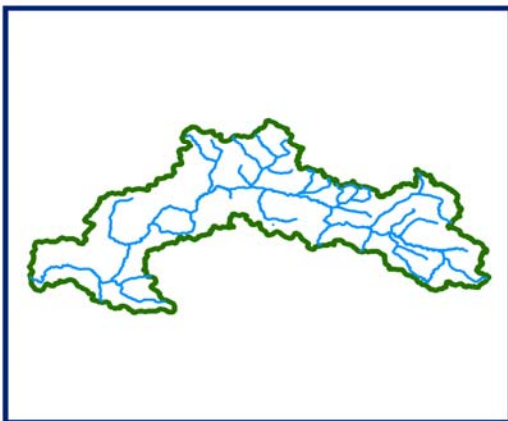
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



DATA USED
DATA NOT AVAILABLE



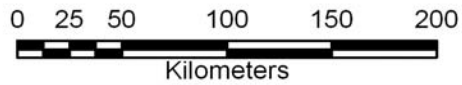
DATA USED
17 FEBRUARY 2014



DATA USED
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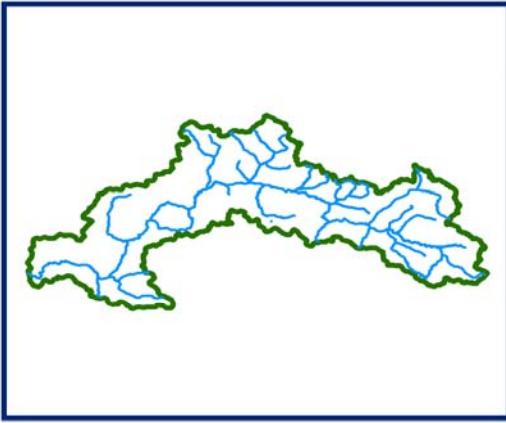


SNOW

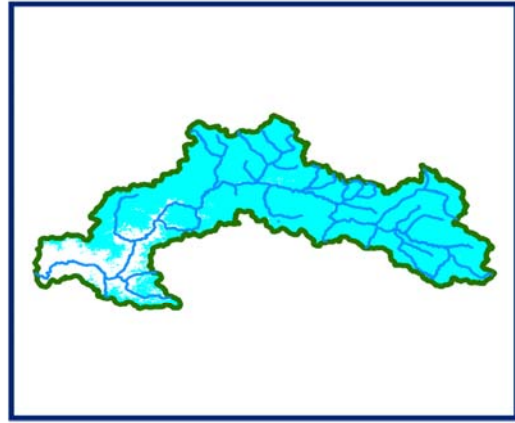


SNOW COVER MAP:

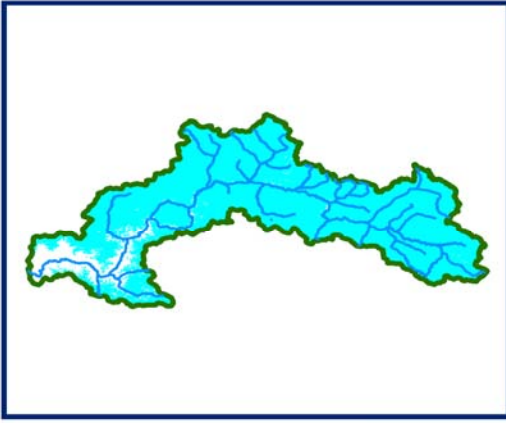
KISANGANGA BASIN



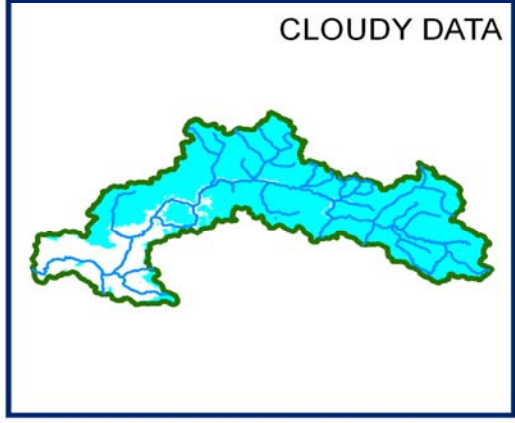
DATA NOT AVAILABLE



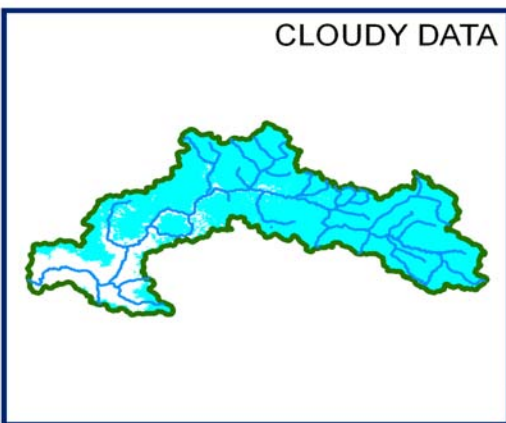
06 MARCH 2014



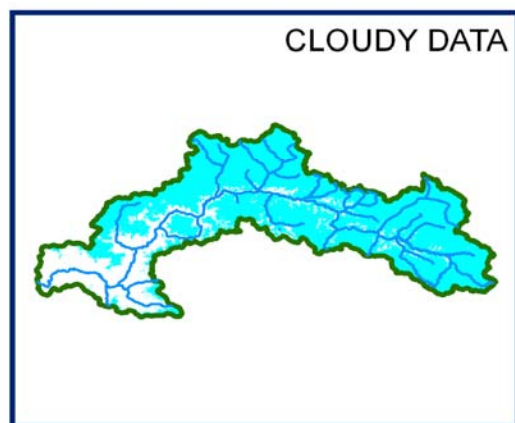
13 MARCH 2014



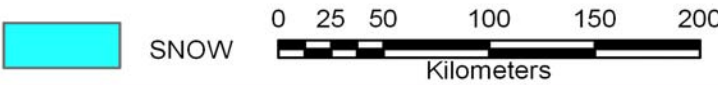
20 MARCH 2014



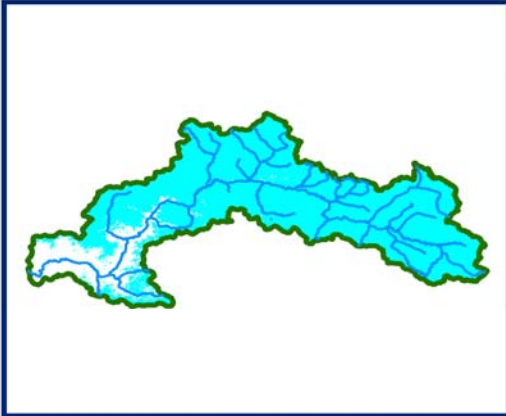
23 MARCH 2014



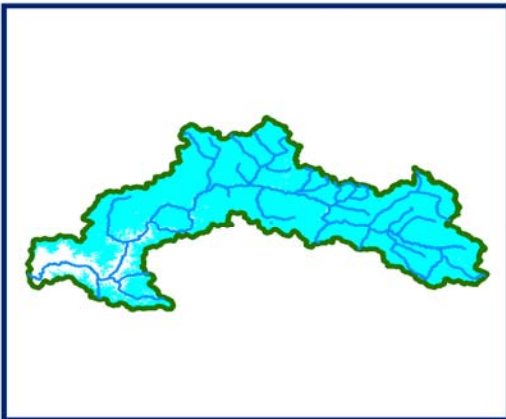
30 MARCH 2014



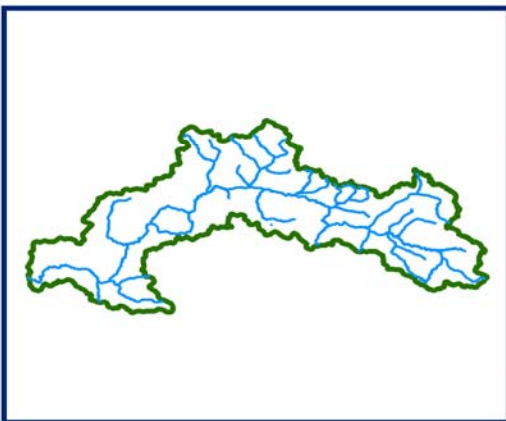
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



DATA USED
06 MARCH 2014



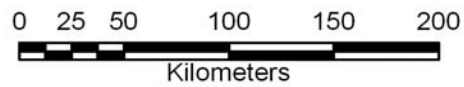
DATA USED
13 MARCH 2014



DATA USED
DATA NOT AVAILABLE

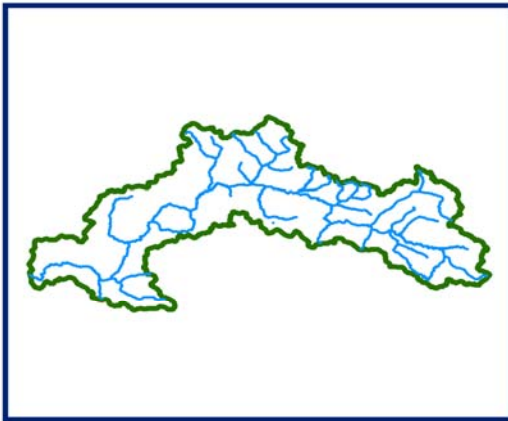


SNOW

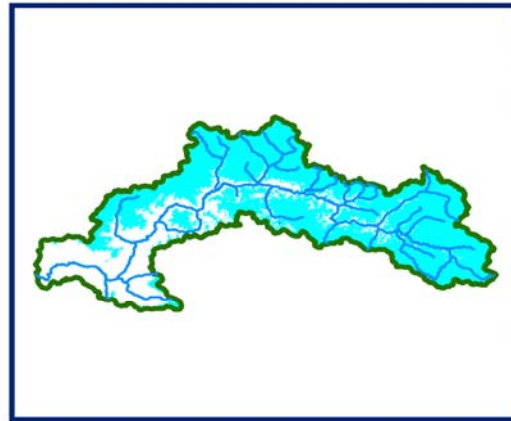


SNOW COVER MAP:

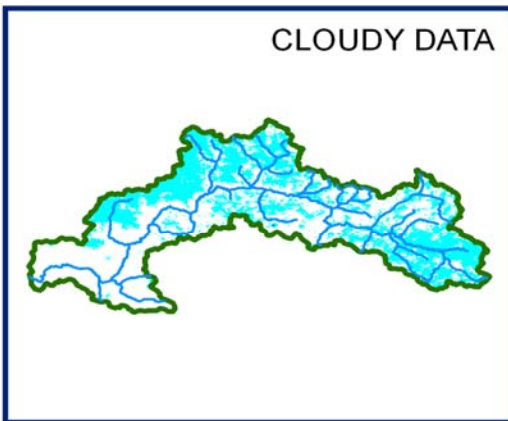
KISANGANGA BASIN



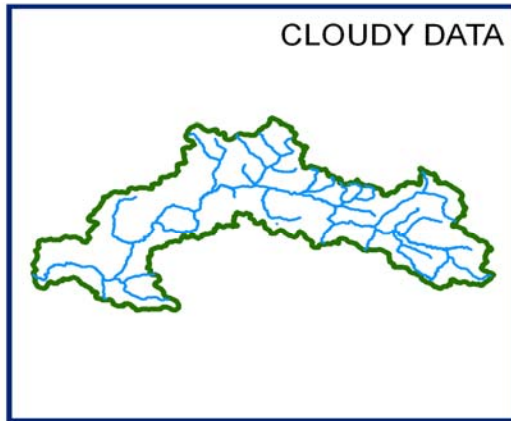
DATA NOT AVAILABLE



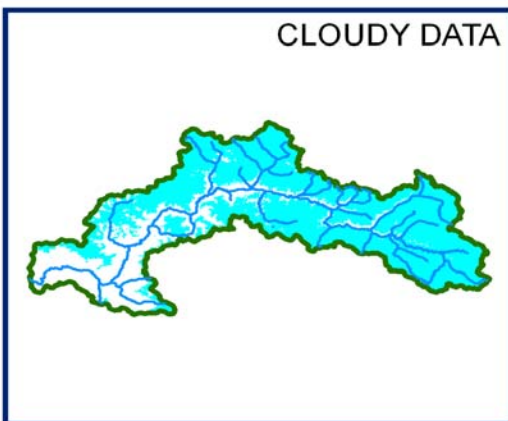
09 APRIL 2014



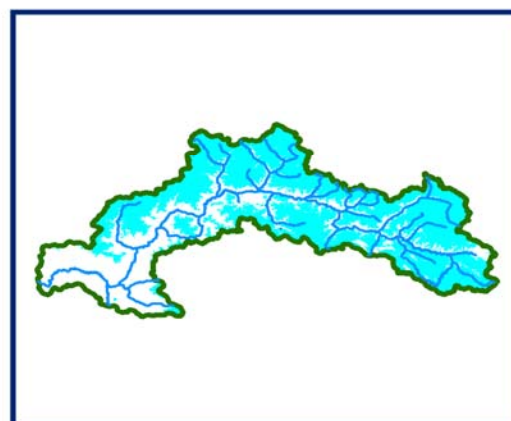
13 APRIL 2014



DATA NOT AVAILABLE



21 APRIL 2014



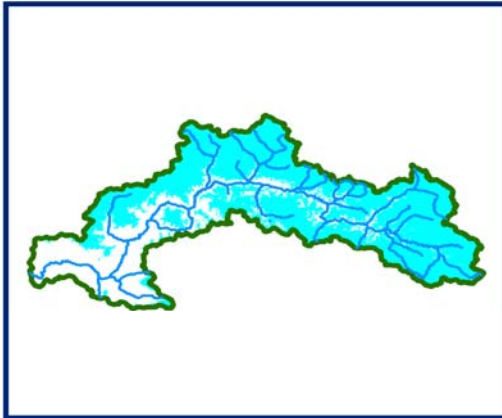
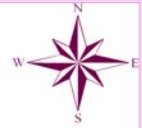
30 APRIL 2014



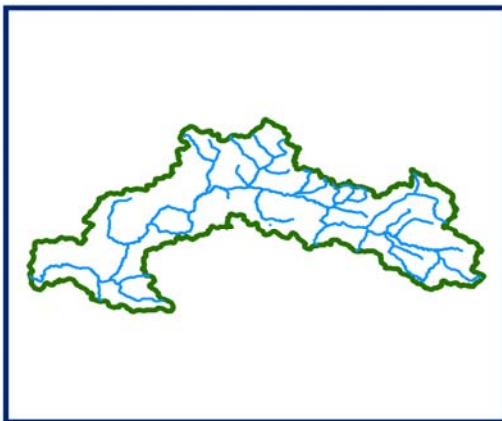
SNOW



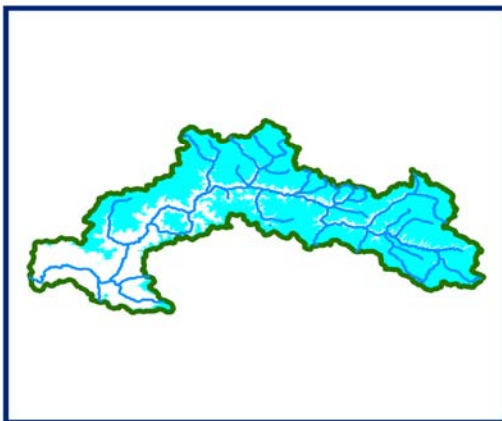
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



DATA USED
09 APRIL 2014



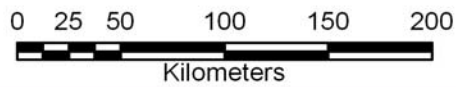
DATA USED
DATA NOT AVAILABLE



DATA USED
28 APRIL 2014
30 APRIL 2014

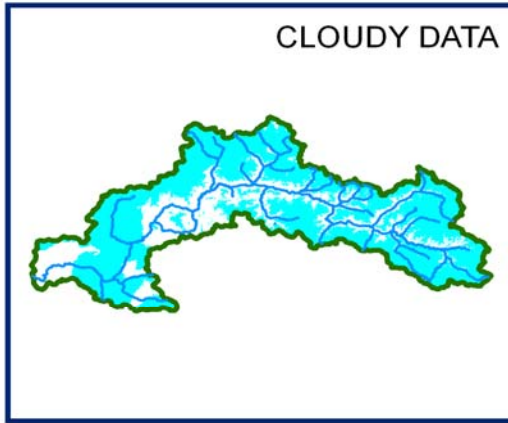


SNOW

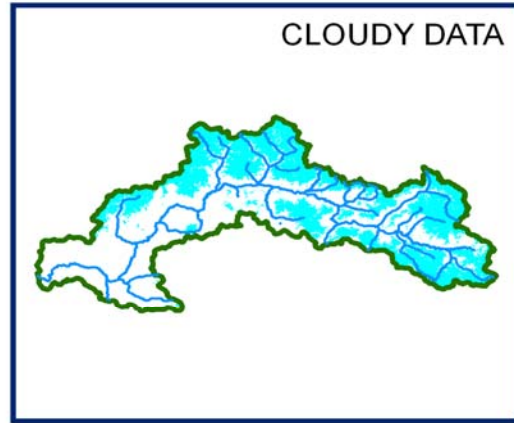


SNOW COVER MAP:

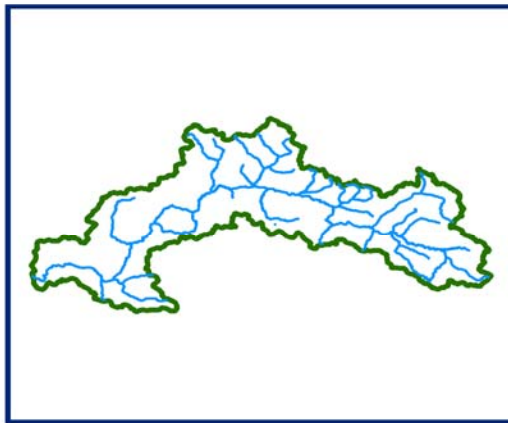
KISANGANGA BASIN



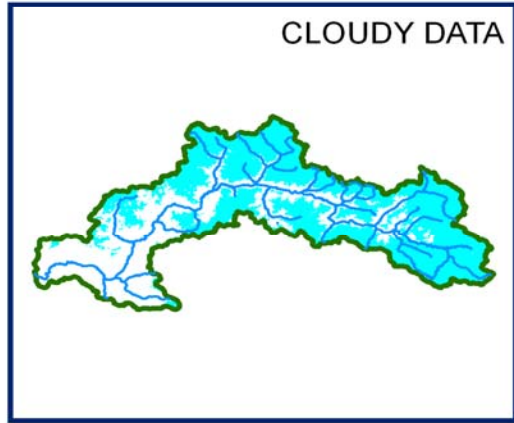
03 MAY 2014



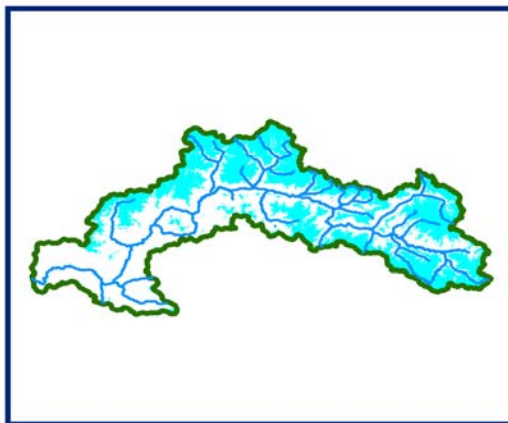
07 MAY 2014



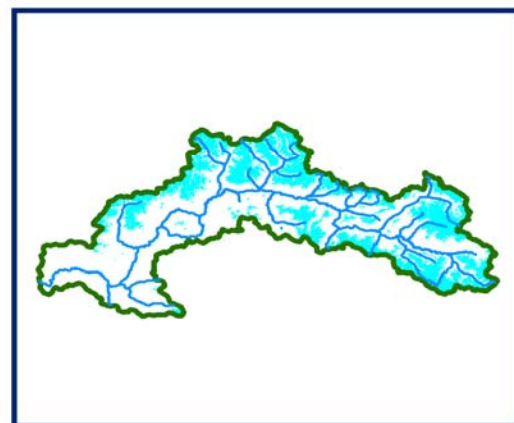
DATA NOT AVAILABLE



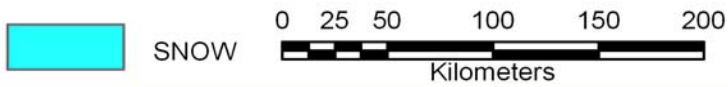
17 MAY 2014



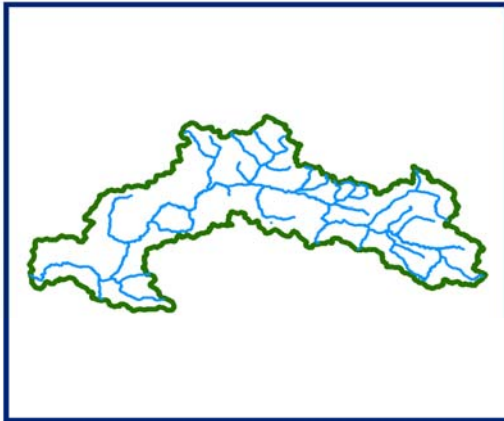
24 MAY 2014



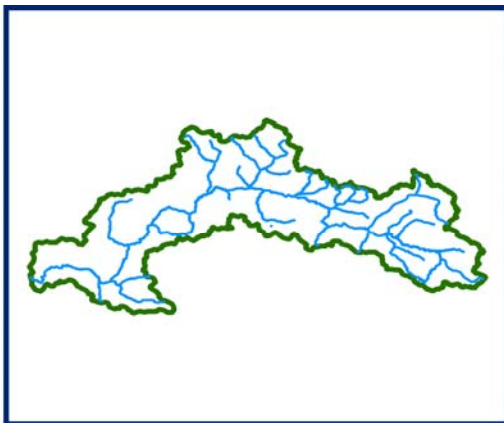
27 MAY 2014



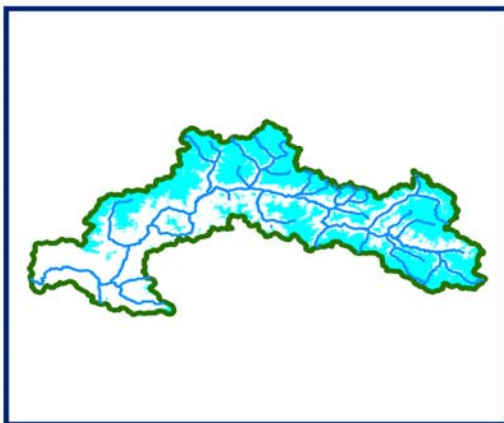
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
DATA NOT AVAILABLE



DATA USED
24 MAY 2014
27 MAY 2014

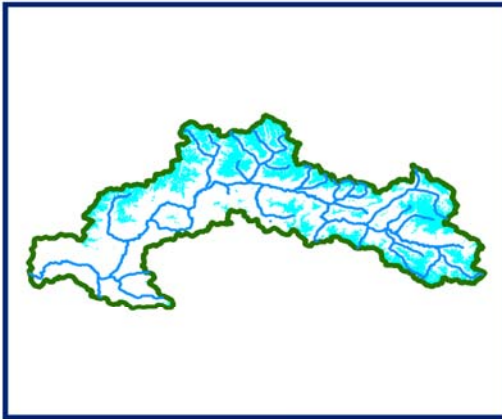


SNOW

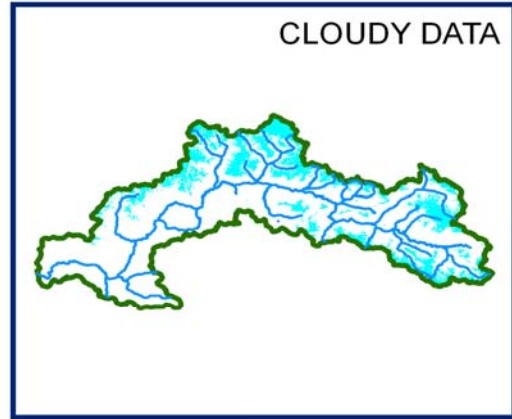


SNOW COVER MAP:

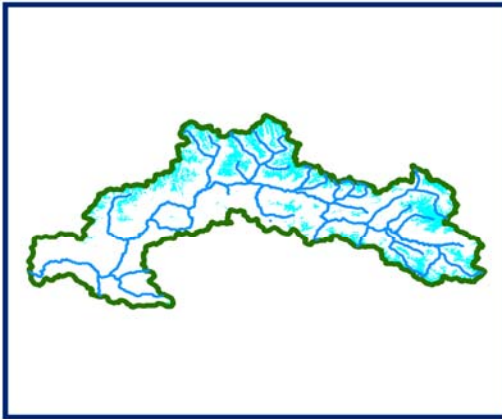
KISANGANGA BASIN



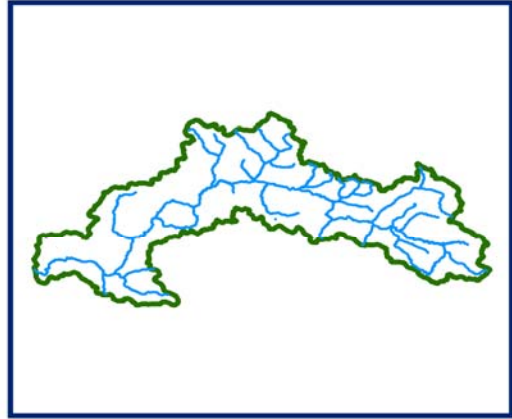
05 JUNE 2014



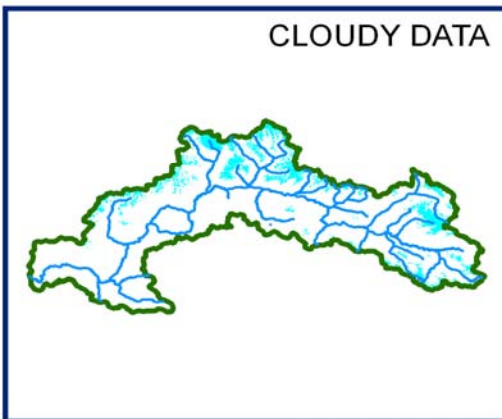
10 JUNE 2014



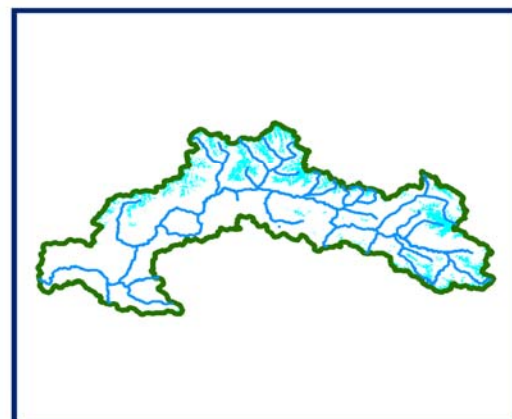
15 JUNE 2014



17 MAY 2014



24 JUNE 2014



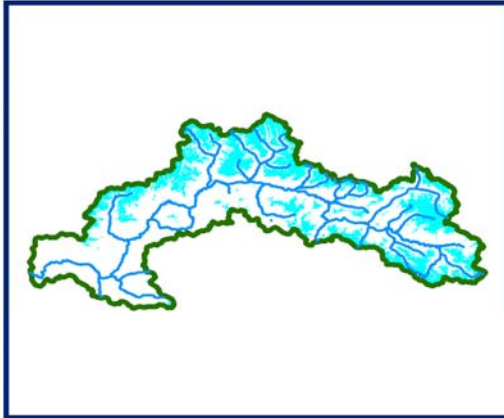
27 JUNE 2014



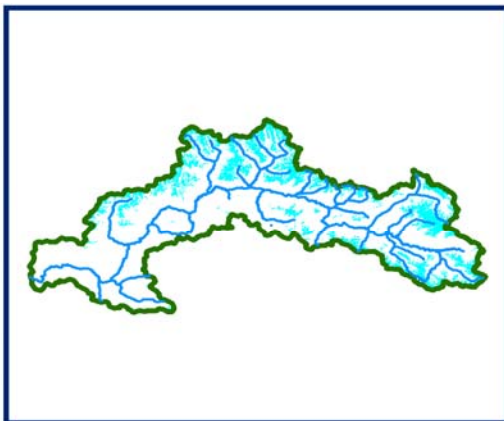
SNOW



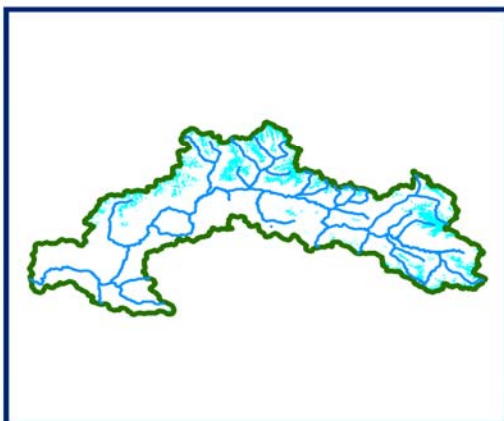
10 DAILY SNOW COVER MAP: KISANGANGA BASIN



DATA USED
05 JUNE 2014



DATA USED
15 JUNE 2014



DATA USED
27 JUNE 2014



SNOW



ASTOR BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: ASTOR

BASIN AREA: 4008 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	3-Oct-13	173	4	4	18-Oct-13	535	13
2	4-Oct-13	184	5	5	23-Oct-13	244	6
3	8-Oct-13	185	5	6	28-Oct-13	1278	32
November 2013							
7	1-Nov-13	2688	67	11	20-Nov-13	2397	60
8	11-Nov-13	2691	67	12	21-Nov-13	2317	58
9	15-Nov-13	2747	69	13	25-Nov-13	2115	53
10	16-Nov-13	2593	65	14	30-Nov-13	2060	51
December 2013							
15	10-Dec-13	2197	55	19	17-Dec-13	2486	62
16	12-Dec-13	3206	80	20	24-Dec-13	3248	81
17	14-Dec-13	2153	54	21	27-Dec-13	3631	91
18	15-Dec-13	2656	66	22	17-Dec-13	2486	62
January 2014							
23	3-Jan-14	3041	76	28	24-Jan-14	3474	87
24	5-Jan-14	3645	91	29	26-Jan-14	3841	96
25	7-Jan-14	3447	86	30	27-Jan-14	3839	96
26	15-Jan-14	3780	94	31	29-Jan-14	3837	96
27	17-Jan-14	3513	88	32	31-Jan-14	3262	81
February 2014							
33	1-Feb-14	3407	85	37	17-Feb-14	3798	95
34	8-Feb-14	3407	85	38	20-Feb-14	3160	79
35	10-Feb-14	3812	95	39	25-Feb-14	3665	91
36	15-Feb-14	3673	92				
March 2014							
40	6-Mar-14	3705	92	44	21-Mar-14	3813	95
41	13-Mar-14	3805	95	45	25-Mar-14	3057	76
42	16-Mar-14	3472	87	46	30-Mar-14	3669	92
43	20-Mar-14	3718	93				
April 2014							
47	8-Apr-14	3064	76	51	23-Apr-14	2969	74
48	9-Apr-14	3359	84	52	27-Apr-14	3379	84
49	13-Apr-14	3039	76	53	28-Apr-14	3334	83
50	14-Apr-14	2948	74	54	30-Apr-14	3205	80

55	21-Apr-14	3418	85				
May 2014							
56	3-May-14	2907	73	60	24-May-14	2618	65
57	7-May-14	2755	69	61	27-May-14	2330	58
58	8-May-14	1668	42	62	31-May-14	2074	52
59	10-May-14	2849	71				
June 14							
63	3-Jun-14	2286	57	67	25-Jun-14	1447	36
64	10-Jun-14	2395	60	68	27-Jun-14	1371	34
65	14-Jun-14	1716	43	69	29-Jun-14	1304	33
66	24-Jun-14	1268	32				

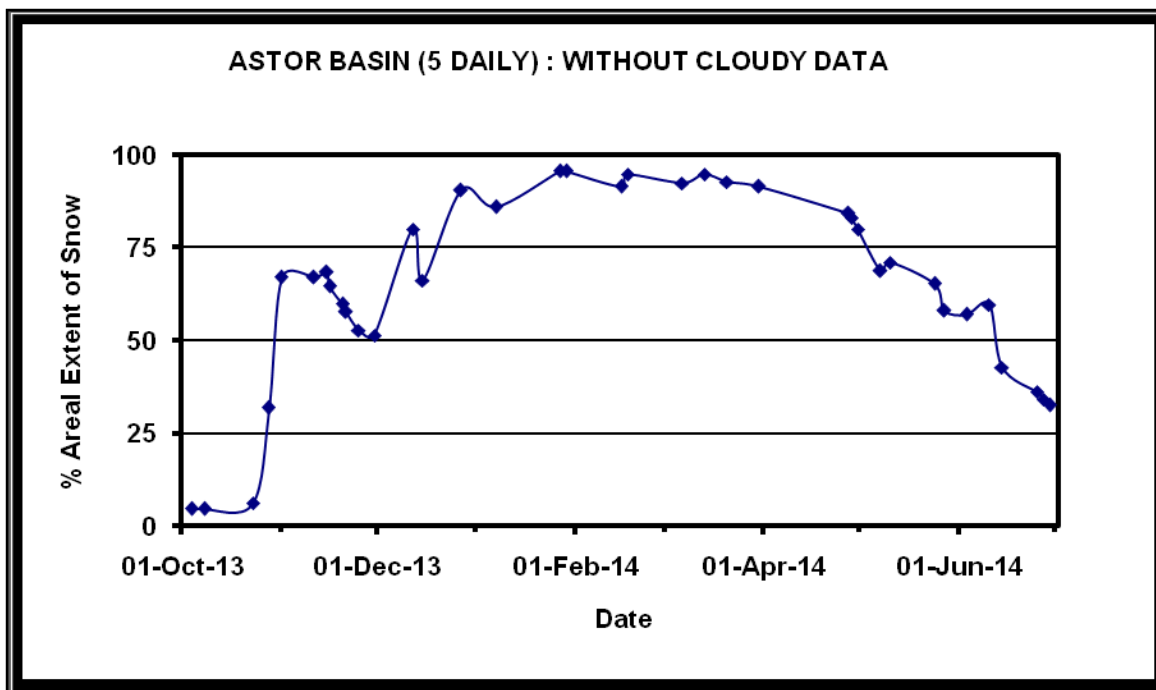
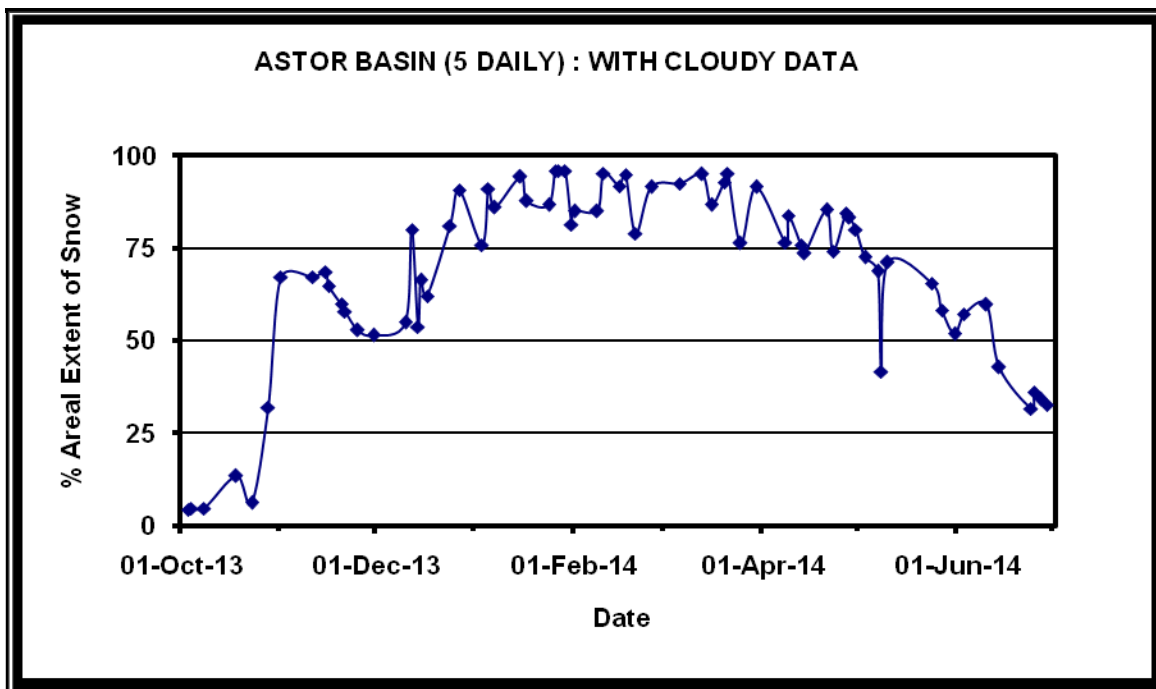
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: ASTOR

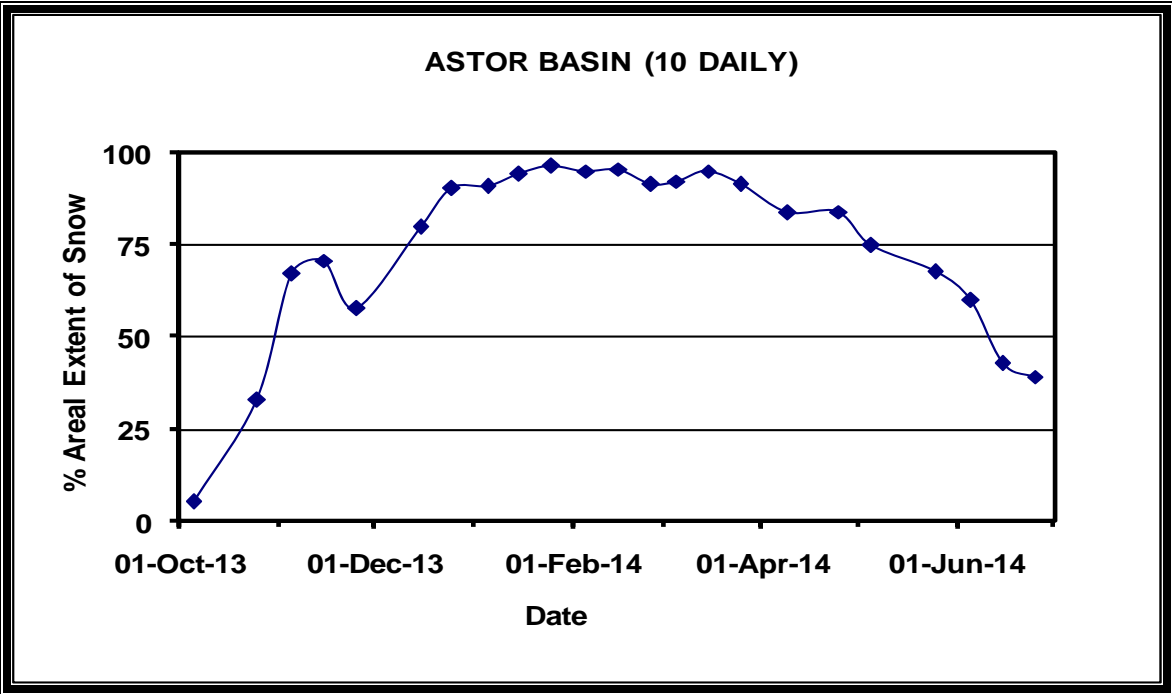
BASIN AREA: 4008 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	4-Oct-13	220	5	2	28-Oct-13	1316	33
November 2013							
3	5-Nov-13	2688	67	5	25-Nov-13	2324	58
4	15-Nov-13	2837	71				
December 2013							
6	15-Dec-13	3206	80	7	27-Dec-13	3631	91
January 2014							
8	5-Jan-14	3647	91	10	27-Jan-14	3873	97
9	15-Jan-14	3768	94				
February 2014							
11	5-Feb-14	3808	95	12	17-Feb-14	3832	96
March 2014							
13	6-Mar-14	3705	92	15	30-Mar-14	3669	92
14	20-Mar-14	3813	95				
April 2014							
16	9-Apr-14	3359	84	16	30-Apr-14	3367	84
May 2014							
17	10-May-14	3004	75	18	24-May-14	2717	68
June 2014							
19	3-Jun-14	2405	60	21	25-Jun-14	1575	39
20	14-Jun-14	1716	43				

Snow cover depletion curve



Snow cover depletion curve



SNOW COVER MAP

SNOW COVER MAP:

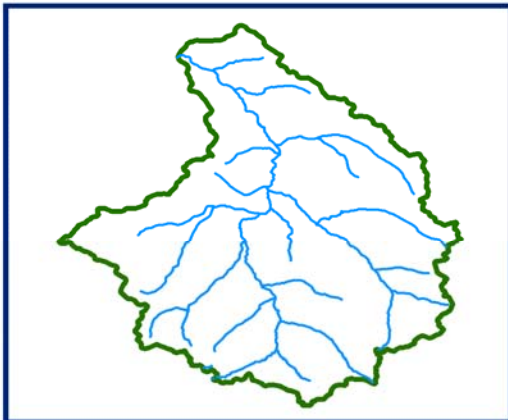
ASTOR BASIN



04 OCTOBER 2013



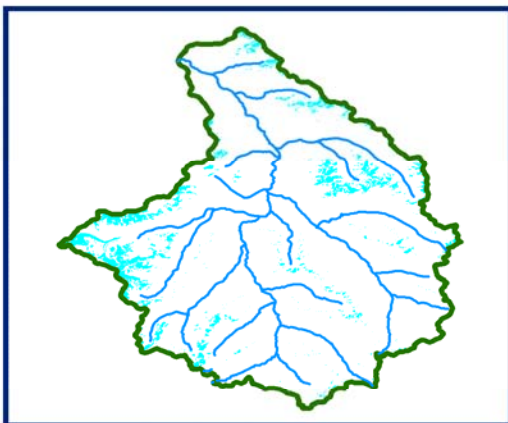
08 OCTOBER 2013



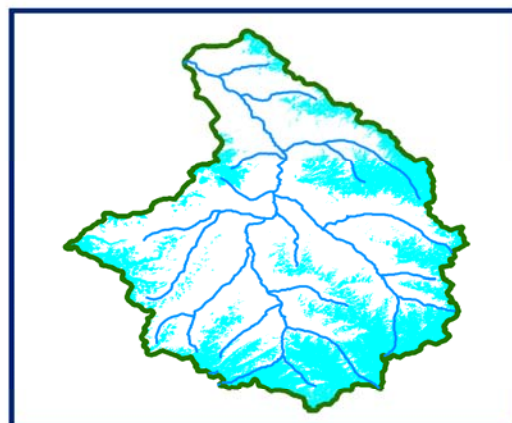
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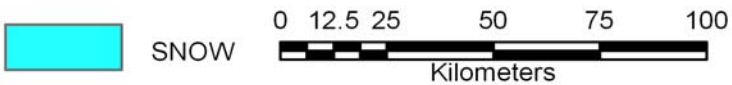
18 OCTOBER 2013



23 OCTOBER 2013



28 OCTOBER 2013



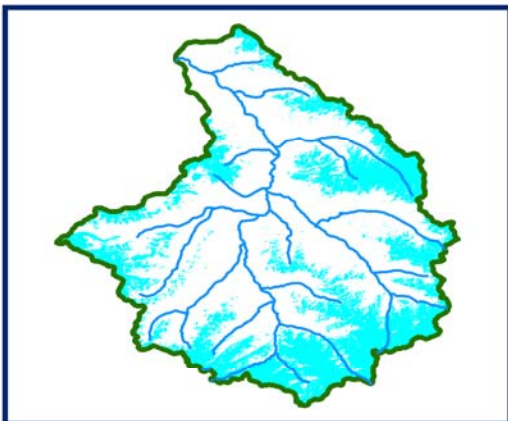
10 DAILY SNOW COVER MAP: ASTOR BASIN



DATA USED
04 OCTOBER 2013
08 OCTOBER 2013



DATA NOT AVAILABLE



DATA USED
23 OCTOBER 2013
28 OCTOBER 2013

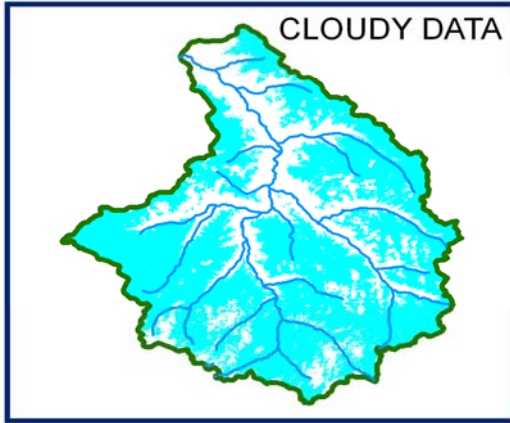


SNOW



SNOW COVER MAP:

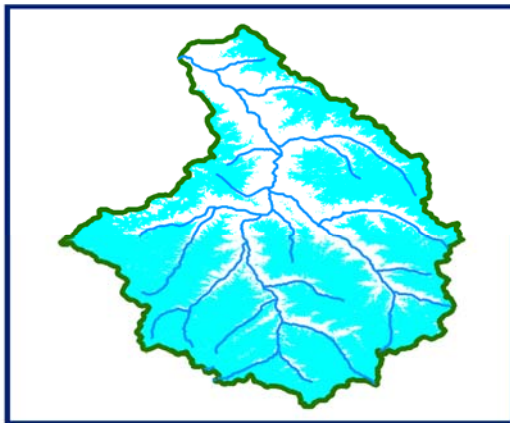
ASTOR BASIN



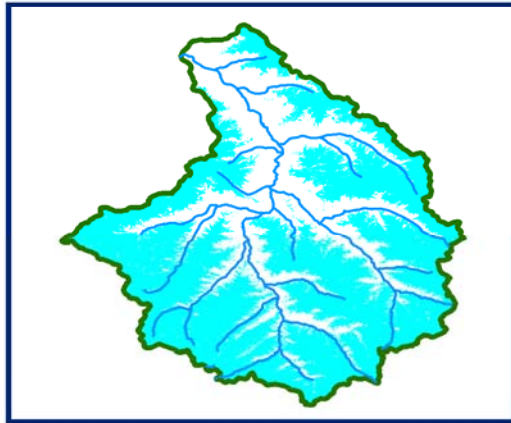
01 NOVEMBER 2013



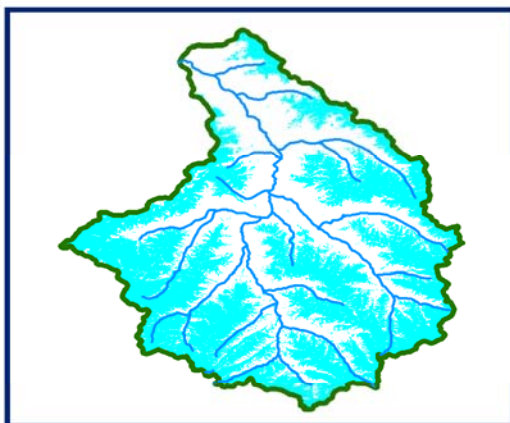
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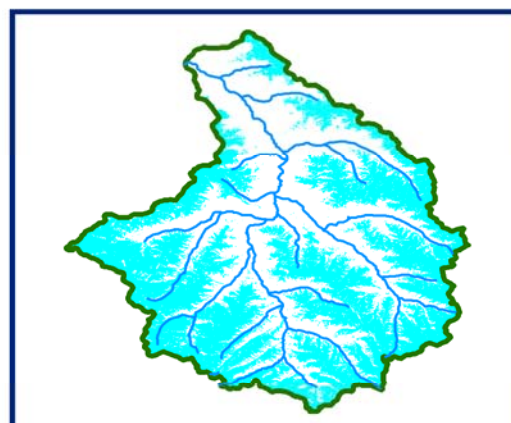
11 NOVEMBER 2013



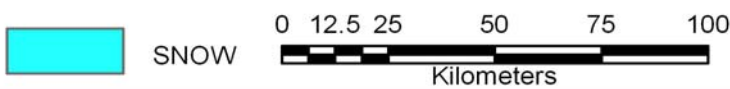
16 NOVEMBER 2013



25 NOVEMBER 2013



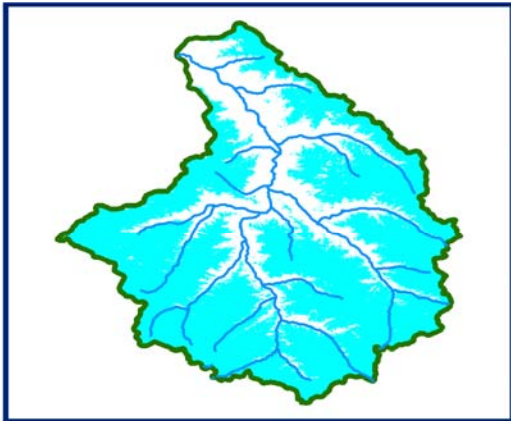
30 NOVEMBER 2013



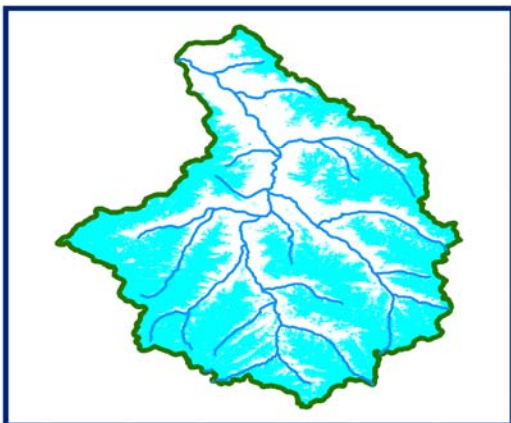
10 DAILY SNOW COVER MAP: ASTOR BASIN



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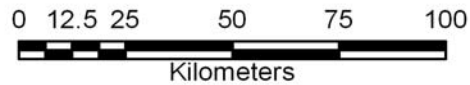
DATA USED
11 NOVEMBER 2013
15 NOVEMBER 2013
20 NOVEMBER 2013



DATA USED
21 NOVEMBER 2013
25 NOVEMBER 2013
30 NOVEMBER 2013

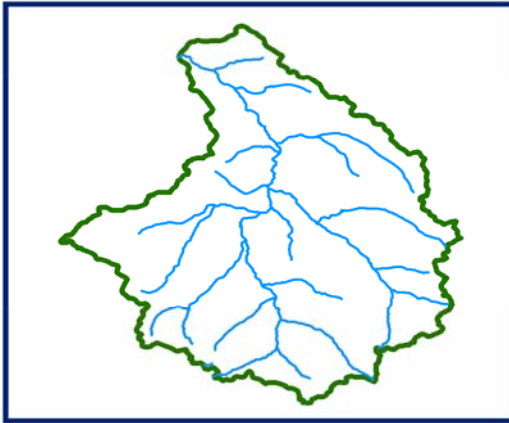


SNOW

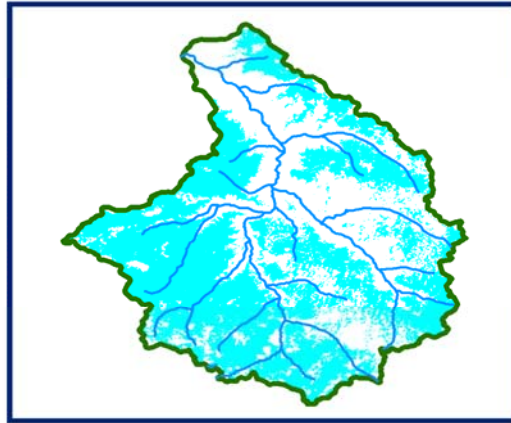


SNOW COVER MAP:

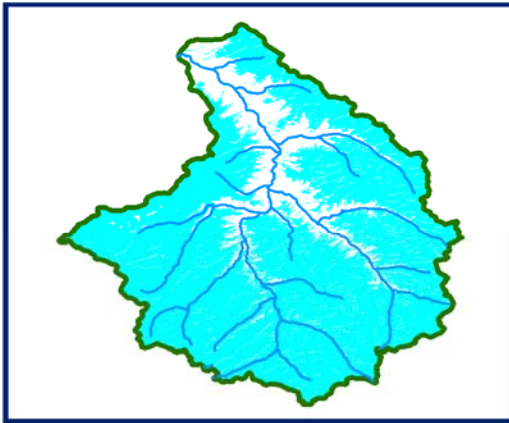
ASTOR BASIN



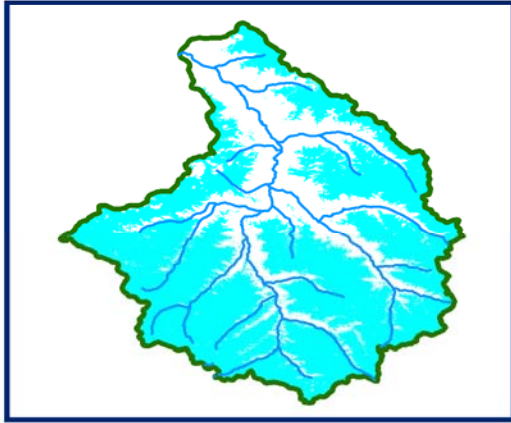
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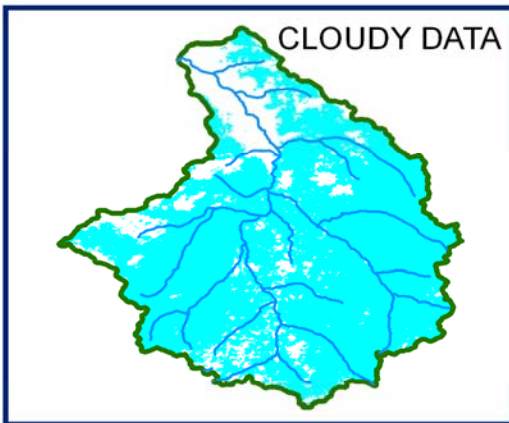
10 DECEMBER 2013



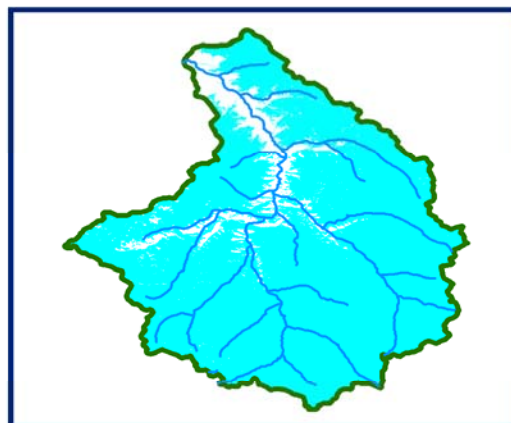
12 DECEMBER 2013



15 DECEMBER 2013



24 DECEMBER 2013



27 DECEMBER 2013



SNOW

0 12.5 25 50 75 100

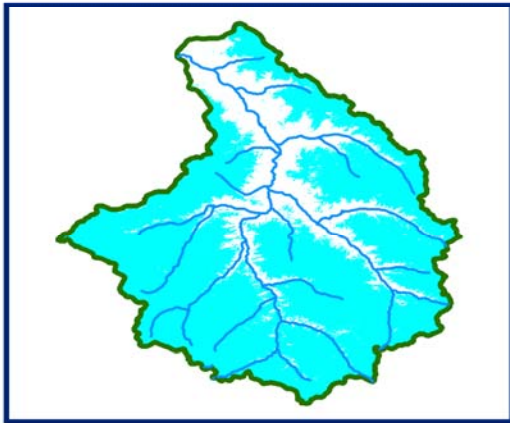


Kilometers

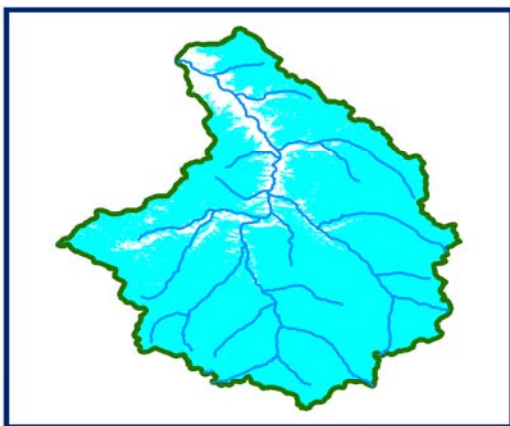
10 DAILY SNOW COVER MAP: ASTOR BASIN



DATA NOT AVAILABLE



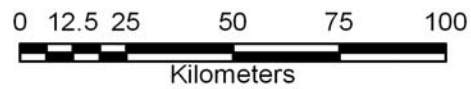
DATA USED
12 DECEMBER 2013
15 DECEMBER 2013



DATA USED
27 DECEMBER 2013

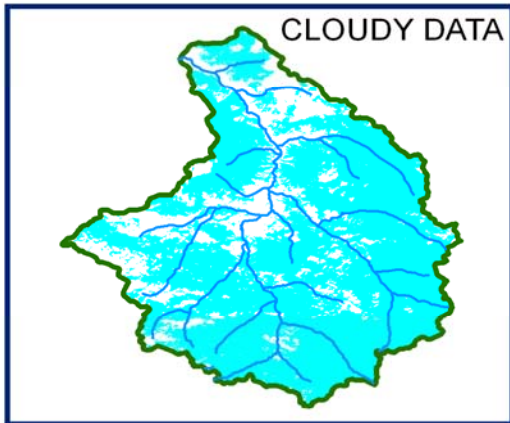


SNOW

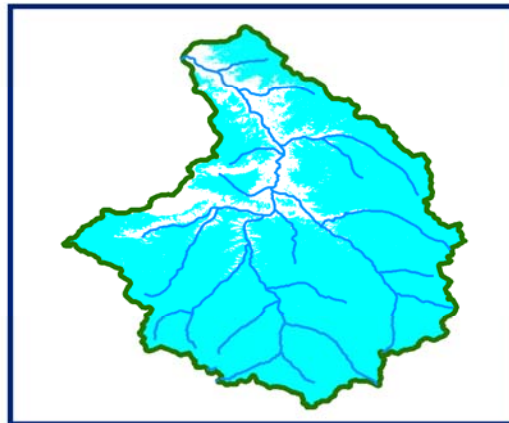


SNOW COVER MAP:

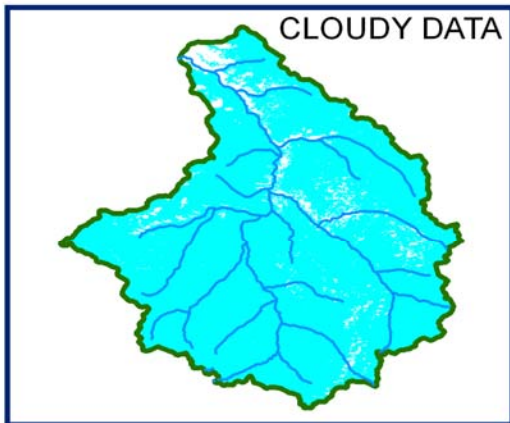
ASTOR BASIN



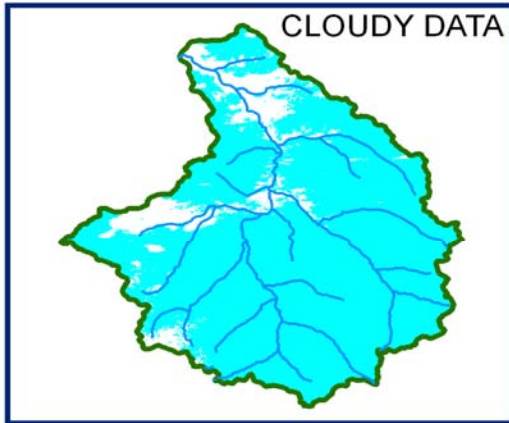
03 JANUARY 2014



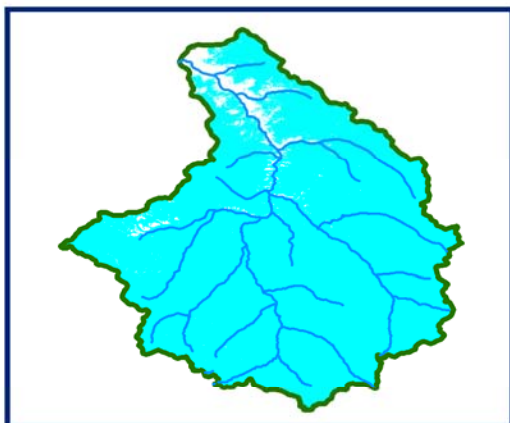
07 JANUARY 2014



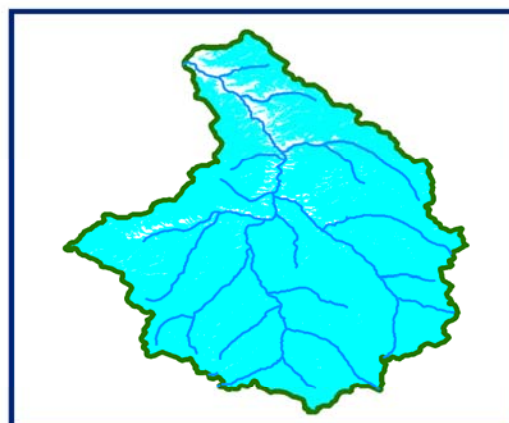
15 JANUARY 2014



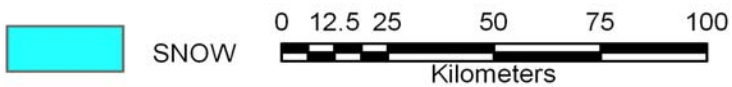
17 JANUARY 2014



27 JANUARY 2014



29 JANUARY 2014



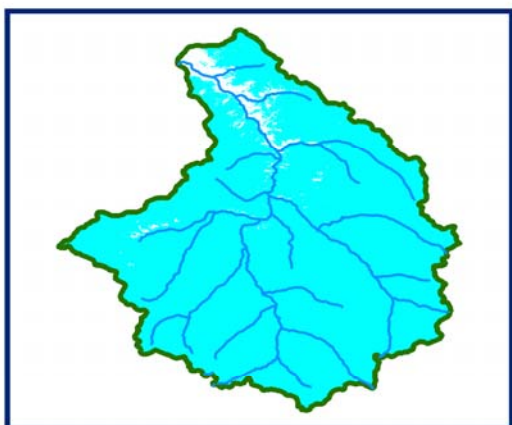
10 DAILY SNOW COVER MAP: ASTOR BASIN



DATA NOT AVAILABLE



DATA NOT AVAILABLE



DATA USED
27 JANUARY 2014
29 JANUARY 2014

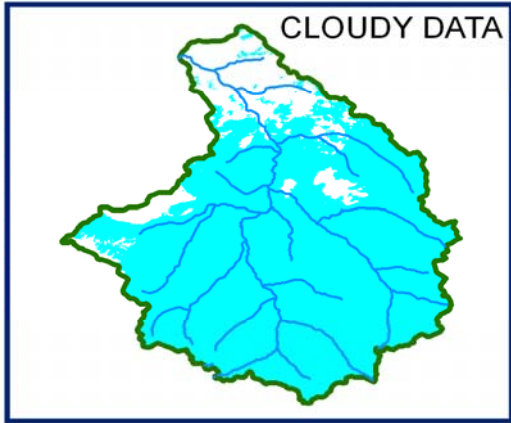


SNOW

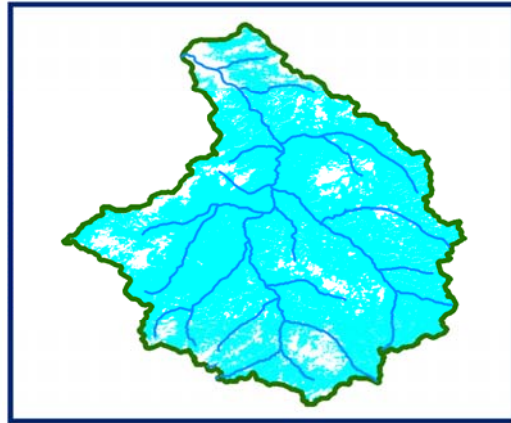


SNOW COVER MAP:

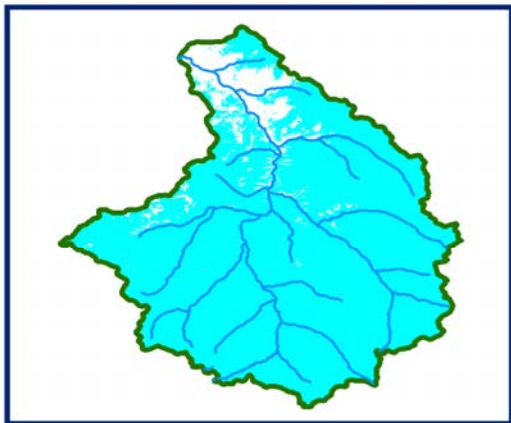
ASTOR BASIN



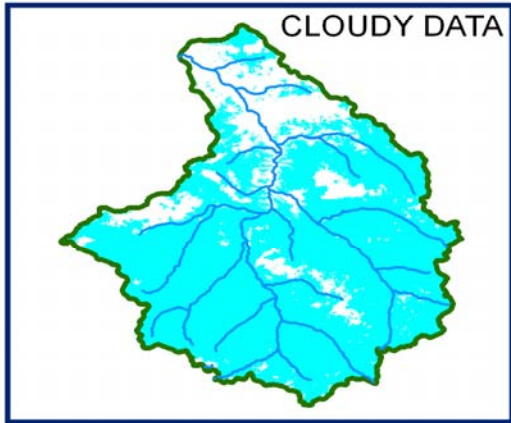
01 FEBRUARY 2014



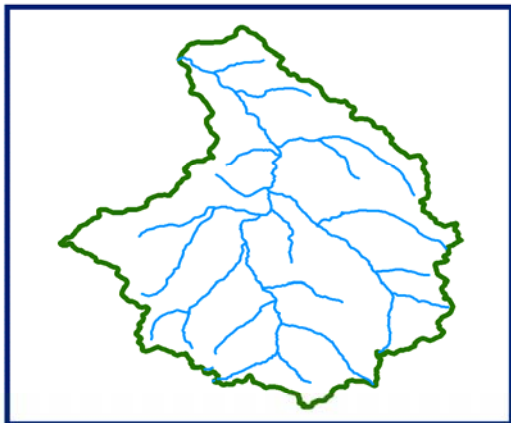
08 FEBRUARY 2014



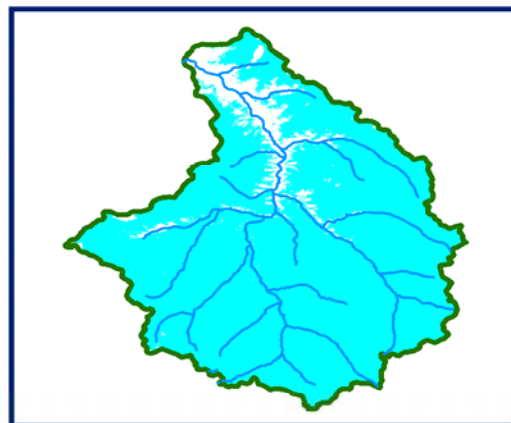
15 FEBRUARY 2014



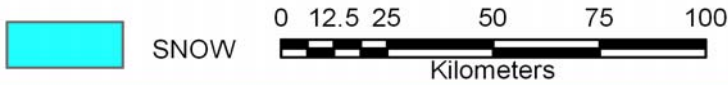
20 FEBRUARY 2014



DATA NOT AVAILABLE



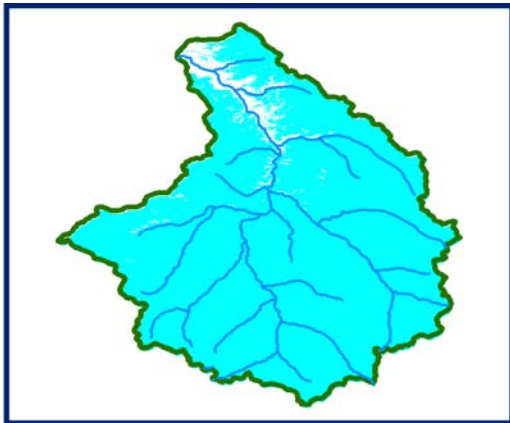
25 FEBRUARY 2014



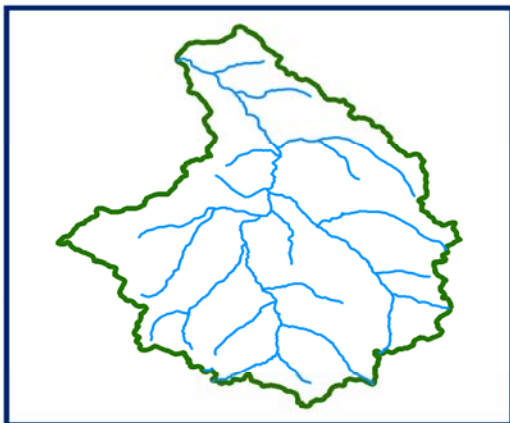
10 DAILY SNOW COVER MAP: ASTOR BASIN



DATA NOT AVAILABLE



DATA USED
15 FEBRUARY 2014
17 FEBRUARY 2014



DATA NOT AVAILABLE



SNOW

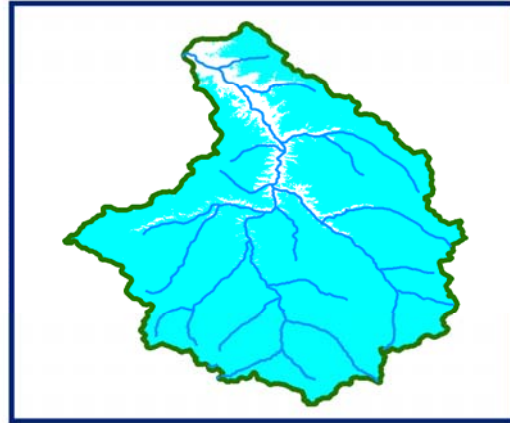


SNOW COVER MAP:

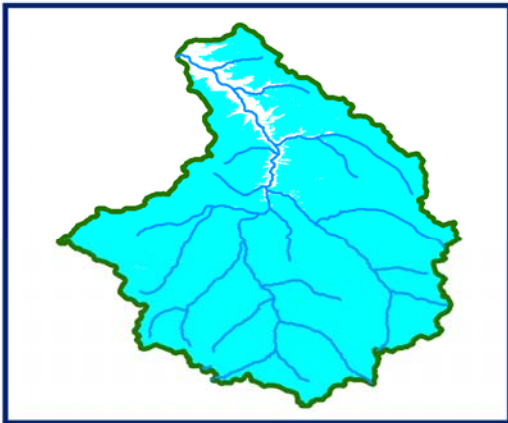
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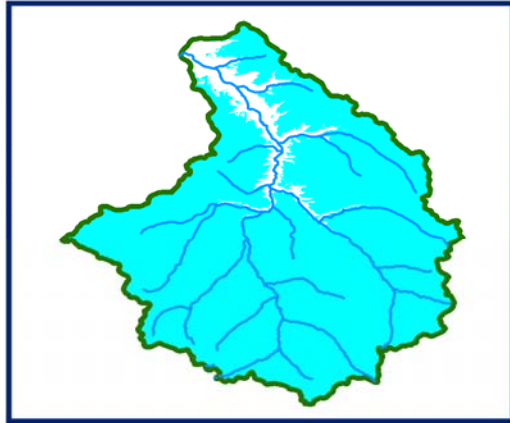
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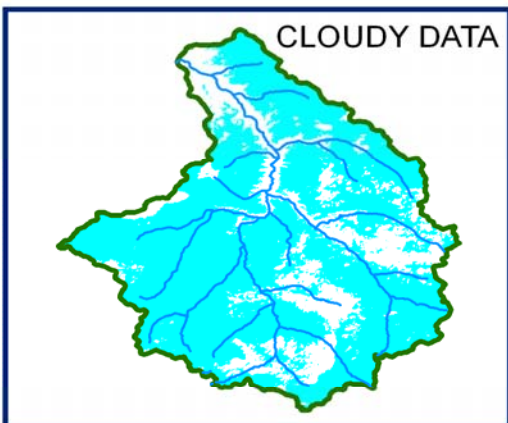
06 MARCH 2014



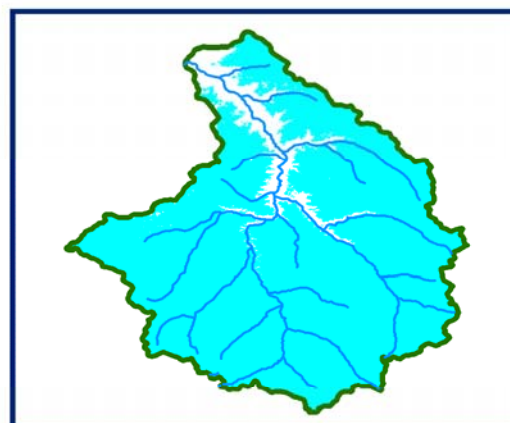
13 MARCH 2014



20 MARCH 2014



25 MARCH 2014



30 MARCH 2014



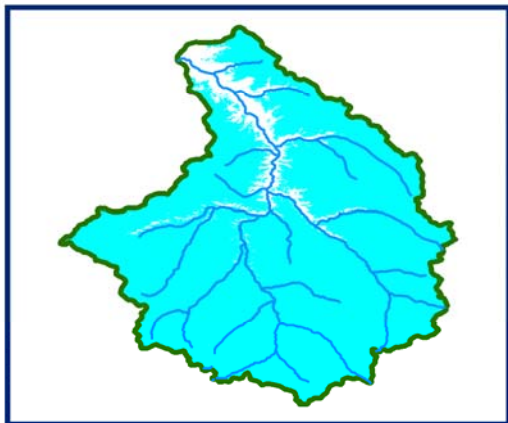
SNOW

0 12.5 25 50 75 100

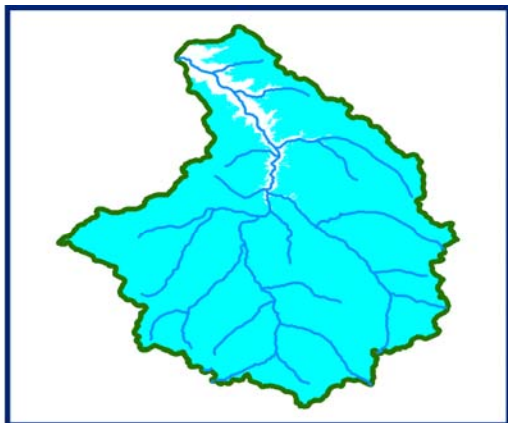


Kilometers

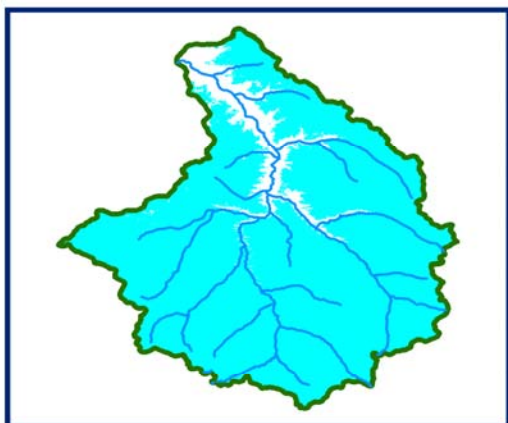
10 DAILY SNOW COVER MAP: ASTOR BASIN



DATA USED
06 MARCH 2014



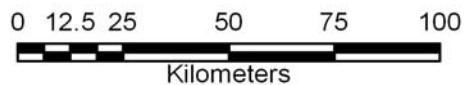
DATA USED
13 MARCH 2014
20 MARCH 2014



DATA USED
30 MARCH 2014

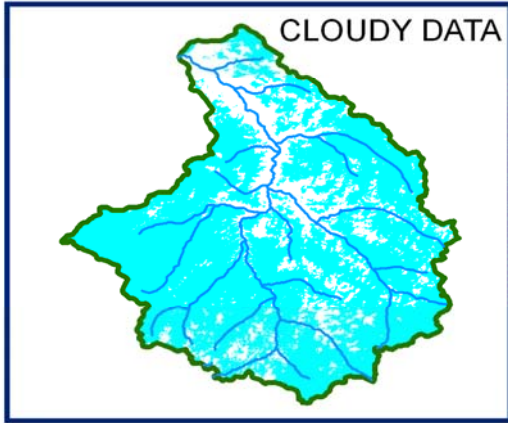


SNOW

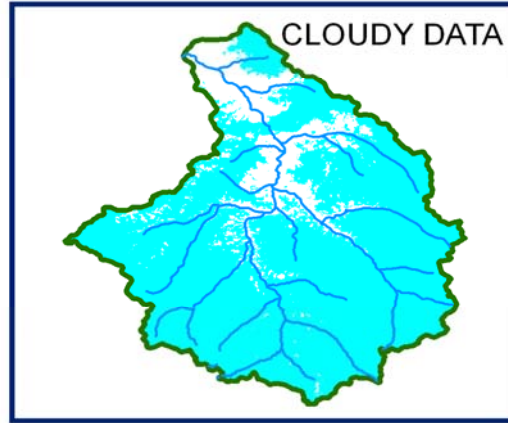


SNOW COVER MAP:

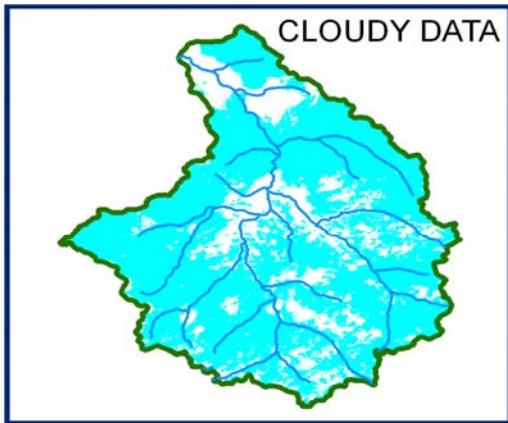
ASTOR BASIN



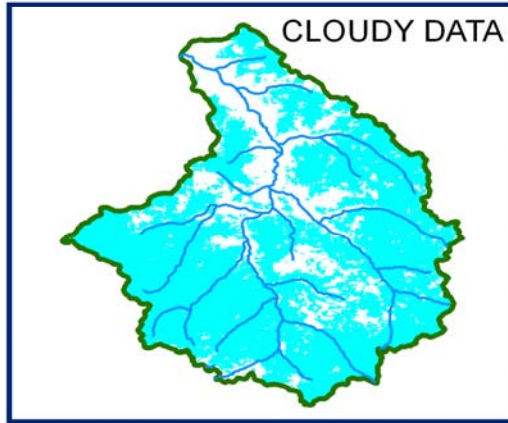
08 APRIL 2014



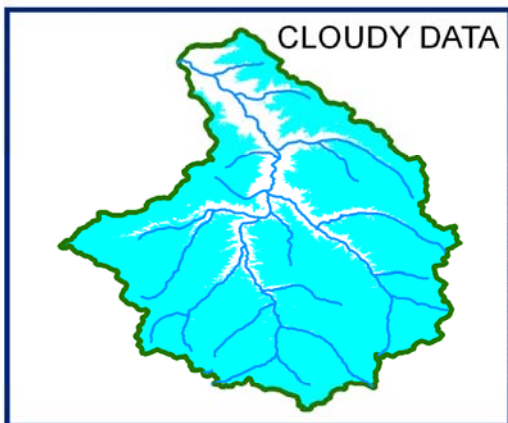
09 APRIL 2014



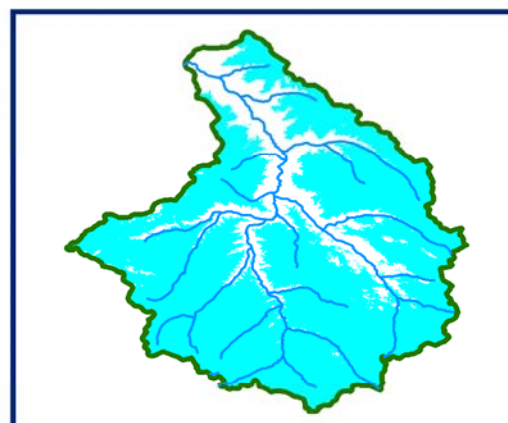
13 APRIL 2014



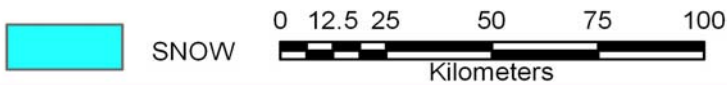
14 APRIL 2014



27 APRIL 2014



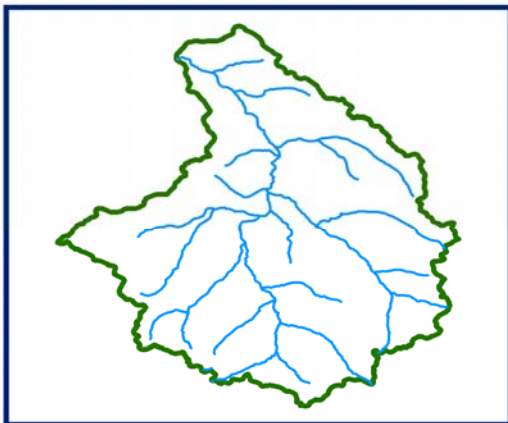
30 APRIL 2014



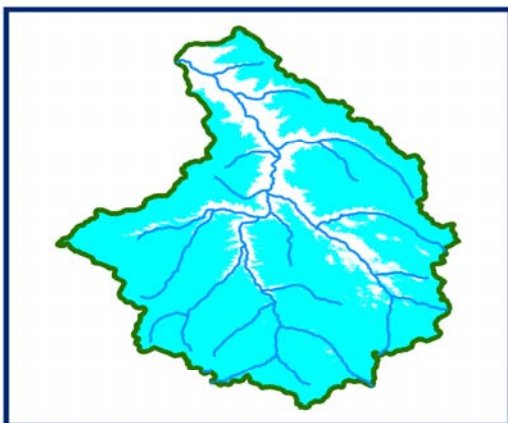
10 DAILY SNOW COVER MAP: ASTOR BASIN



DATA NOT AVAILABLE



DATA NOT AVAILABLE



DATA USED
27 APRIL 2014
28 APRIL 2014
30 APRIL 2014

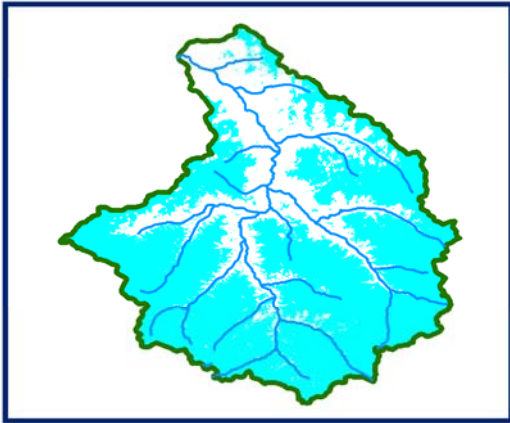


SNOW

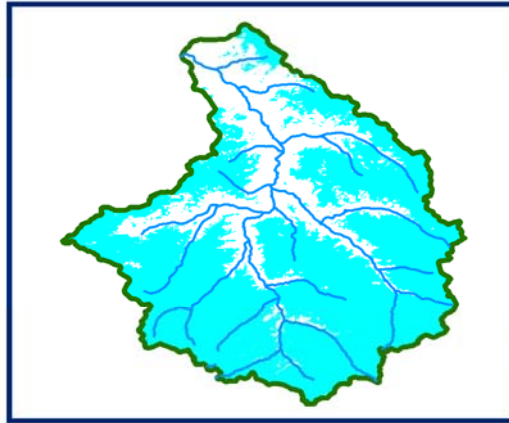


SNOW COVER MAP:

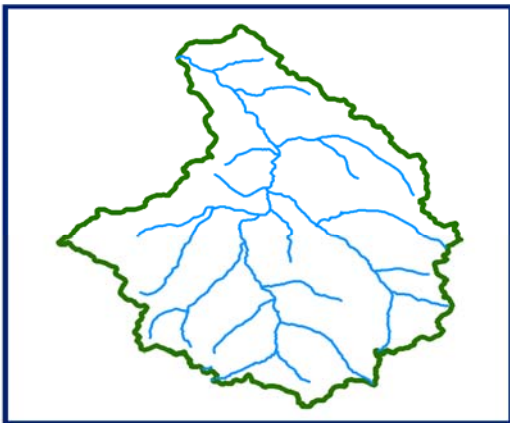
ASTOR BASIN



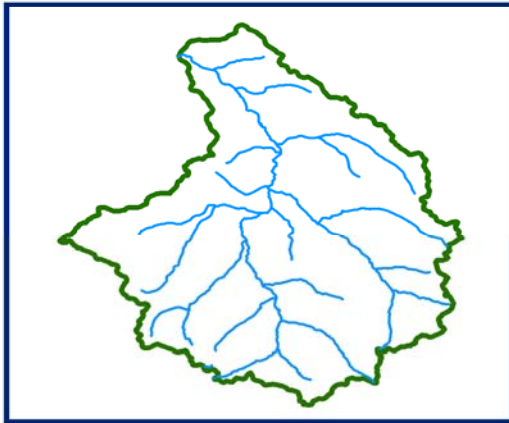
07 MAY 2014



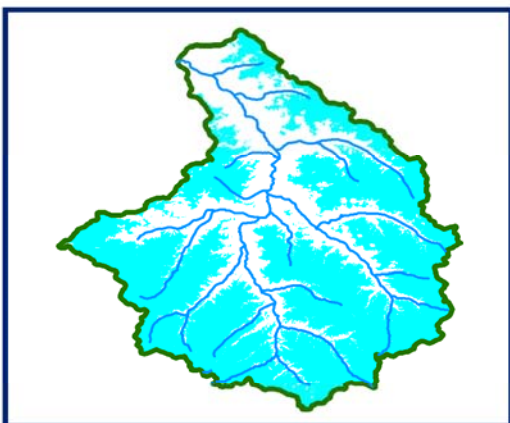
10 MAY 2014



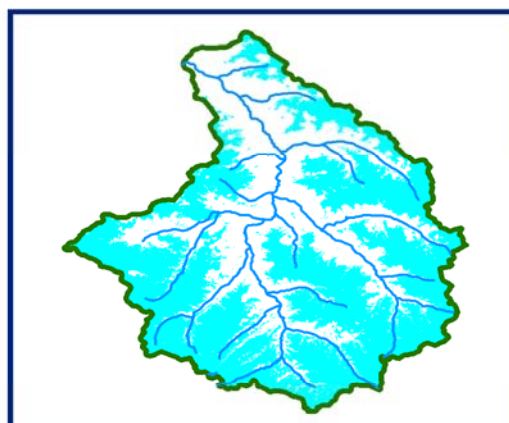
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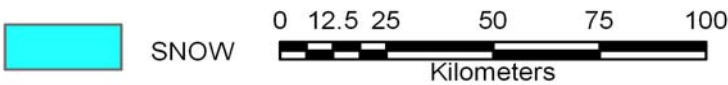
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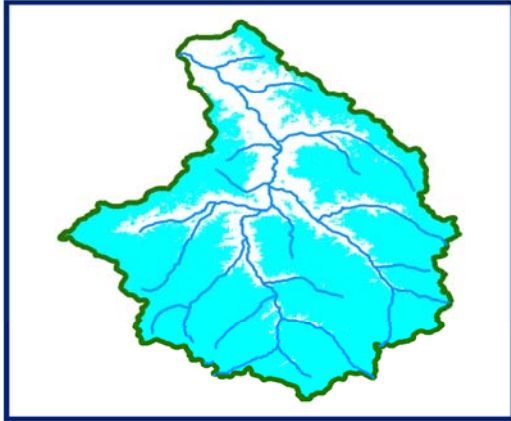
24 MAY 2014



27 MAY 2014



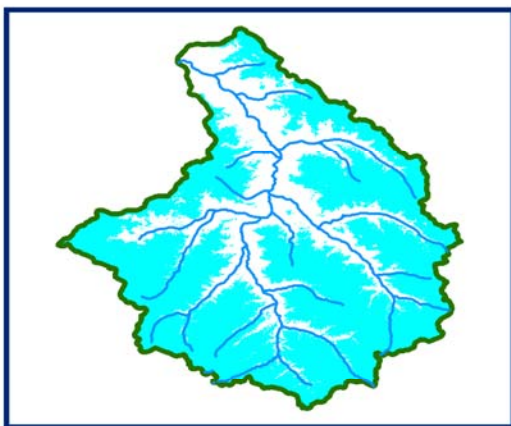
10 DAILY SNOW COVER MAP: ASTOR BASIN



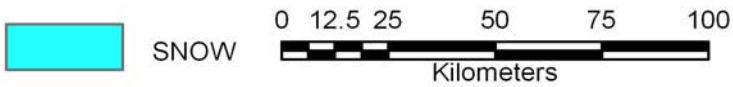
DATA USED
07 MAY 2014
10 MAY 2014



DATA NOT AVAILABLE

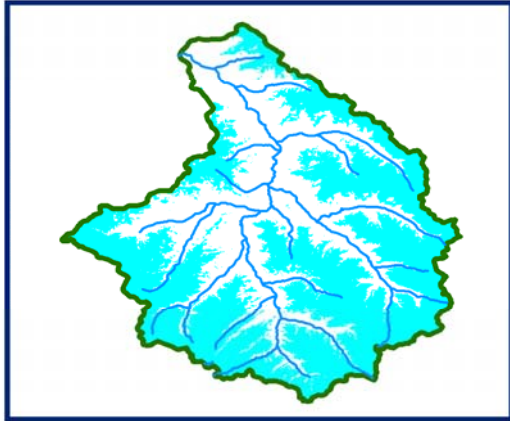


DATA USED
24 MAY 2014
27 MAY 2014

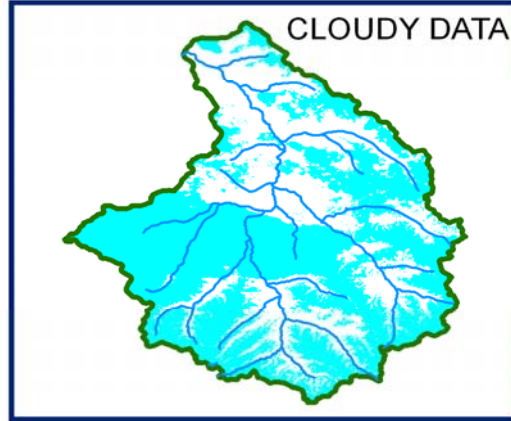


SNOW COVER MAP:

ASTOR BASIN



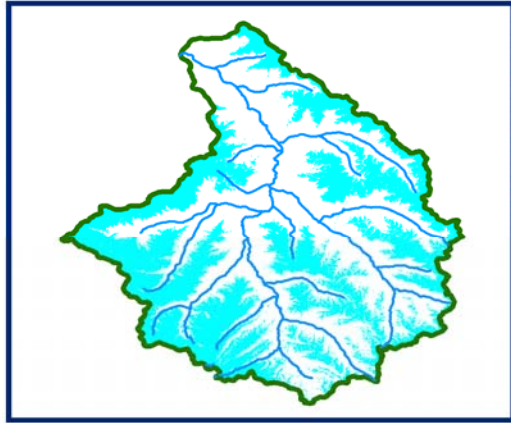
03 JUNE 2014



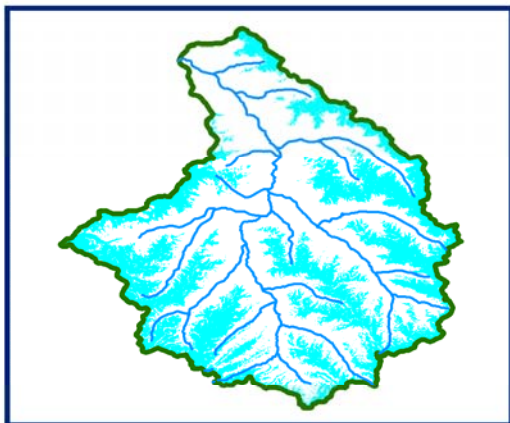
10 JUNE 2014



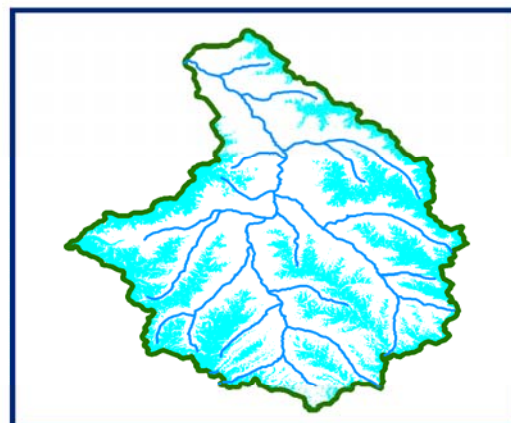
DATA NOT AVAILABLE



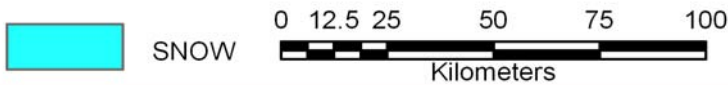
14 JUNE 2014



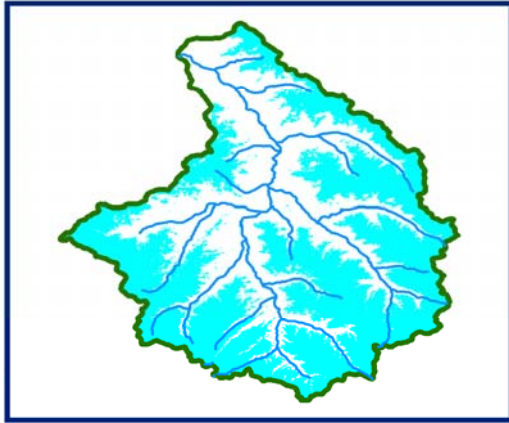
25 JUNE 2014



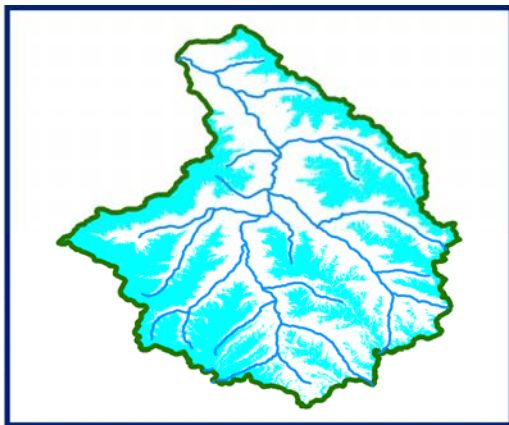
29 JUNE 2014



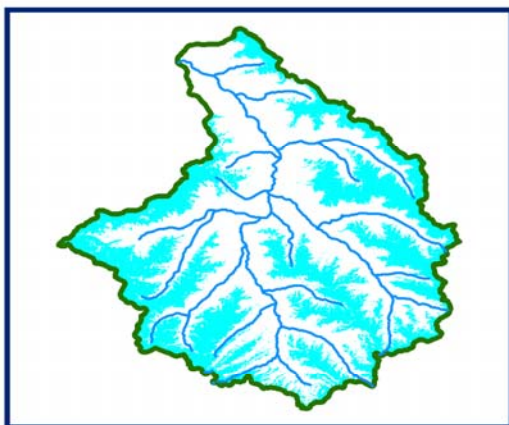
10 DAILY SNOW COVER MAP: ASTOR BASIN



**DATA USED
03 JUNE 2014**



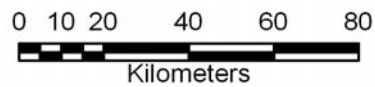
**DATA USED
14 JUNE 2014**



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



SNOW



SHIGO BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: SHIGO

BASIN AREA: 5539 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	03-Oct-13	15	0	7	20-Oct-13	933	17
2	06-Oct-13	47	1	8	21-Oct-13	829	15
3	11-Oct-13	15	0	9	23-Oct-13	520	9
4	15-Oct-13	1688	30	10	25-Oct-13	695	13
5	16-Oct-13	1327	24	11	28-Oct-13	2206	40
6	18-Oct-13	683	12				
November 2013							
12	1-Nov-13	2610	47	17	21-Nov-13	3090	56
13	2-Nov-13	2686	48	18	25-Nov-13	3181	57
14	11-Nov-13	2701	49	19	26-Nov-13	3562	64
15	16-Nov-13	2915	53	20	30-Nov-13	3710	67
16	20-Nov-13	3078	56				
December 2013							
21	10-Dec-13	3131	57	26	20-Dec-13	3596	65
22	12-Dec-13	3596	65	27	24-Dec-13	2990	54
23	14-Dec-13	4638	84	28	26-Dec-13	3920	71
24	15-Dec-13	5325	96	29	27-Dec-13	5325	96
25	17-Dec-13	3122	56				
January 2014							
30	3-Jan-14	5397	97	35	24-Jan-14	5531	100
31	5-Jan-14	5058	91	36	27-Jan-14	5496	99
32	7-Jan-14	4979	90	37	29-Jan-14	5442	98
33	15-Jan-14	5053	91	38	31-Jan-14	5384	97
34	17-Jan-14	5221	94				
February 2014							
39	1-Feb-14	5223	94	44	17-Feb-14	5459	99
40	6-Feb-14	5436	98	45	20-Feb-14	5306	96
41	8-Feb-14	5500	99	46	24-Feb-14	5376	97
42	10-Feb-14	5495	99	47	25-Feb-14	5330	96
43	15-Feb-14	5535	100				
March 2014							
48	6-Mar-14	5174	93	49	13-Mar-14	5516	100

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
50	16-Mar-14	4351	79	54	25-Mar-14	4162	75
51	20-Mar-14	5269	95	55	26-Mar-14	5341	96
52	21-Mar-14	5205	94	56	30-Mar-14	4894	88
53	23-Mar-14	5273	95				
April 2014							
57	9-Apr-14	4889	88	61	23-Apr-14	4553	82
58	13-Apr-14	4285	77	62	28-Apr-14	4558	82
59	14-Apr-14	4683	85	63	30-Apr-14	4591	83
60	21-Apr-14	4956	89				
May 2014							
64	3-May-14	4257	77	69	22-May-14	2360	43
65	7-May-14	4161	75	70	24-May-14	3661	66
66	8-May-14	3060	55	71	27-May-14	3390	61
67	10-May-14	4620	83	72	31-May-14	2989	54
68	17-May-14	4548	82				
June 2014							
73	1-Jun-14	3212	58	78	24-Jun-14	2203	40
74	5-Jun-14	3241	59	79	25-Jun-14	1690	31
75	6-Jun-14	3142	57	80	27-Jun-14	1481	27
76	10-Jun-14	2629	47	81	29-Jun-14	1319	24
77	15-Jun-14	2509	45				

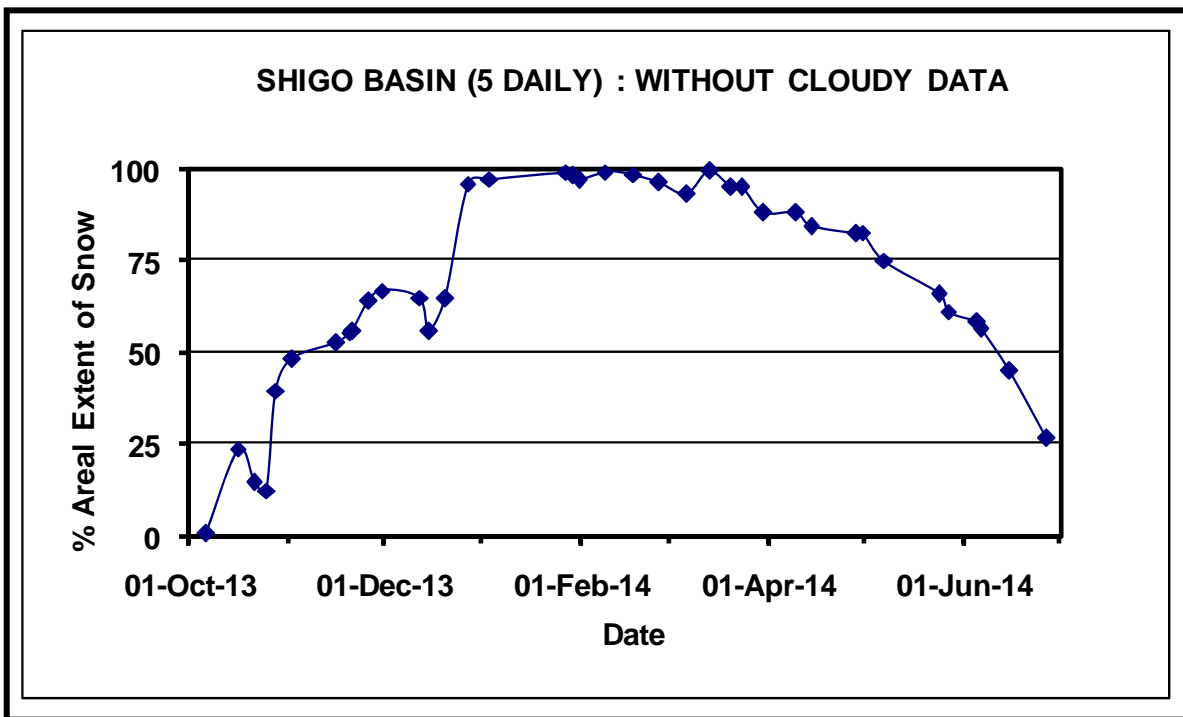
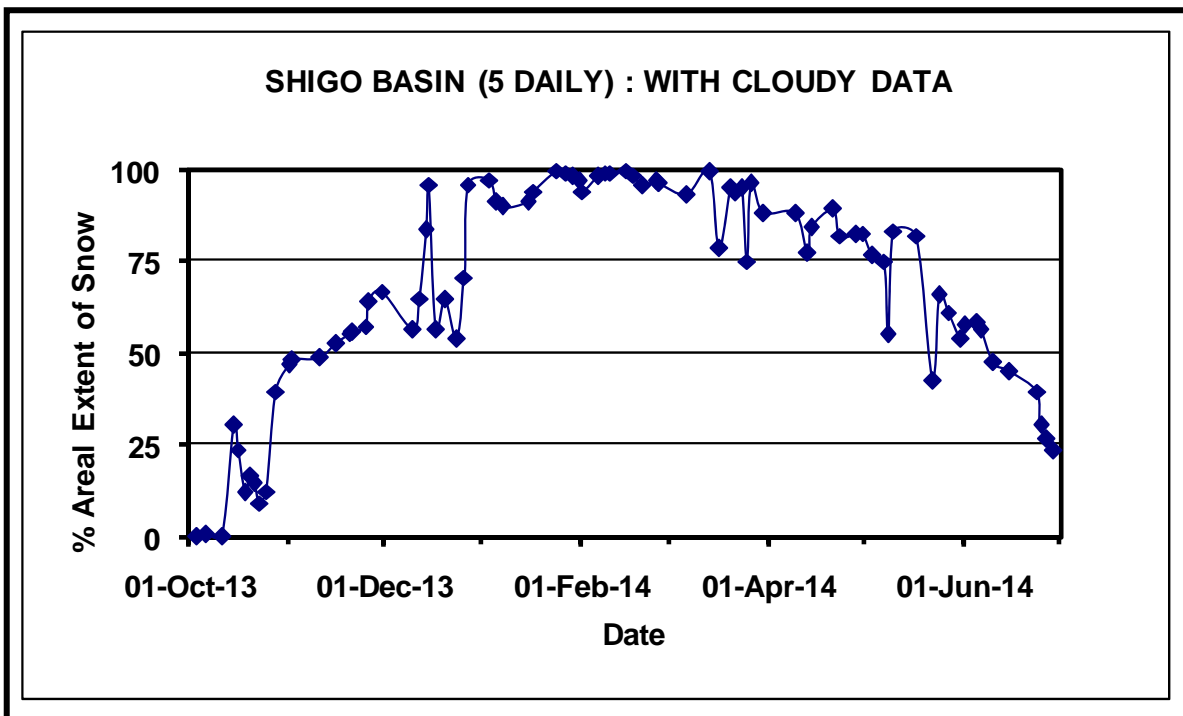
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: SHIGO

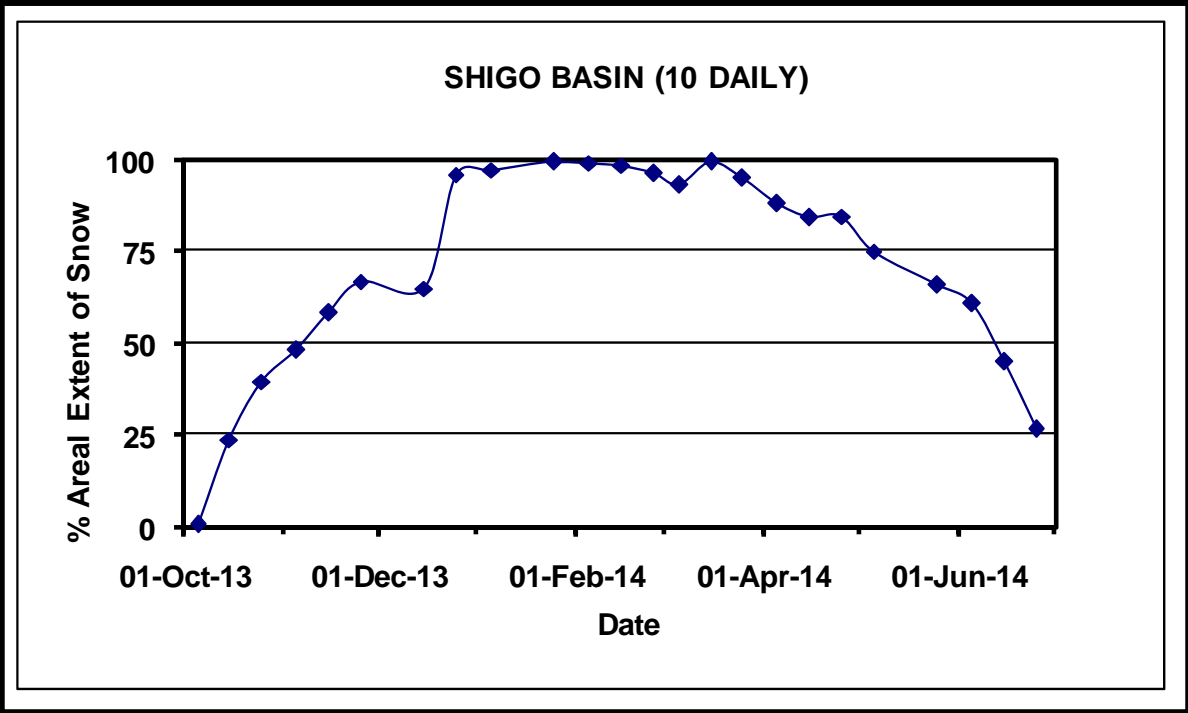
BASIN AREA: 5539 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	5-Oct-13	47	1	2	25-Oct-13		40
2	15-Oct-13	1329	24				
November 2013							
3	5-Nov-13	2686	48	5	25-Nov-13	3711	67
4	15-Nov-13	3244	59				
December 2013							
6	15-Dec-13	3600	65	7	25-Dec-13	5325	96
January 2014							
8	5-Jan-14	5397	97	9	25-Jan-14	5509	99
February 2014							
10	5-Feb-14	5500	99	11	25-Feb-14	5325	96
11	15-Feb-14	5459	99				
March 2014							
12	5-Mar-14	5174	93	14	25-Mar-14	5273	95
13	15-Mar-14	5521	100				
April 2014							
15	5-Apr-14	4889	88	17	25-Apr-14	4688	85
16	15-Apr-14	4683	85				
May 2014							
18	5-May-14	4161	75	19	25-May-14	3661	66
June 2014							
20	5-Jun-14	3375	59	22	25-Jun-14	1481	27
21	15-Jun-14	2509	45				

Snow cover depletion curve



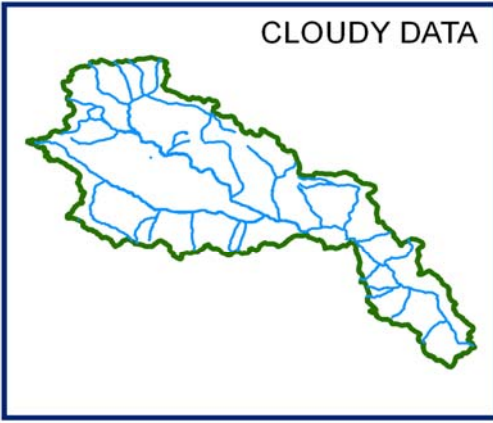
Snow cover depletion curve



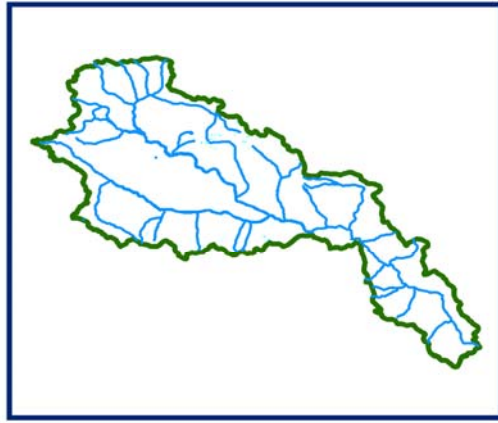
SNOW COVER MAP

SNOW COVER MAP:

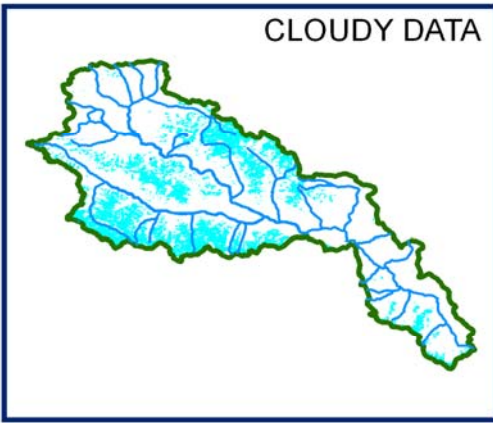
SHIGO BASIN



03 OCTOBER 2013



06 OCTOBER 2013



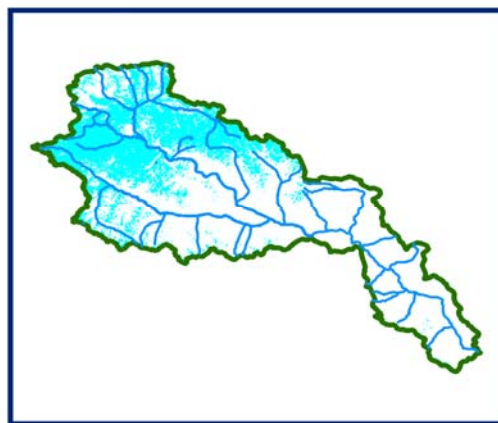
15 OCTOBER 2013



20 OCTOBER 2013



25 OCTOBER 2013



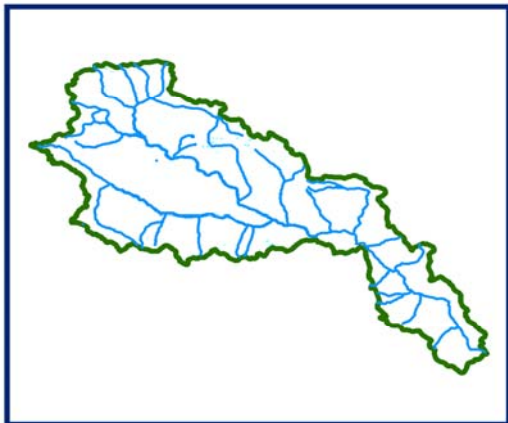
28 OCTOBER 2013



SNOW



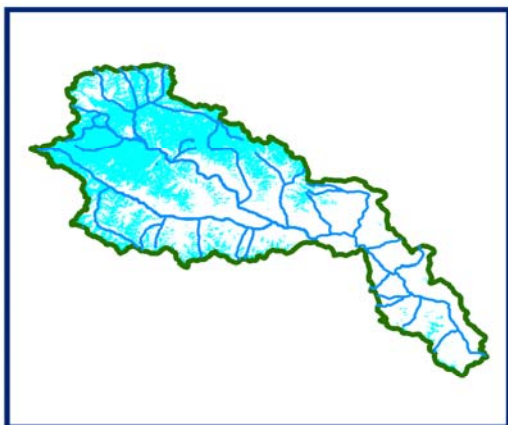
10 DAILY SNOW COVER MAP: SHIGO BASIN



DATA USED
06 OCTOBER 2013



DATA USED
DATA NOT AVAILABLE



DATA USED
21 OCTOBER 2013
25 OCTOBER 2013
28 OCTOBER 2013



SNOW

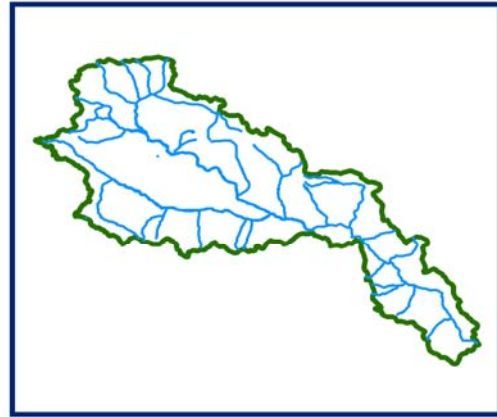


SNOW COVER MAP:

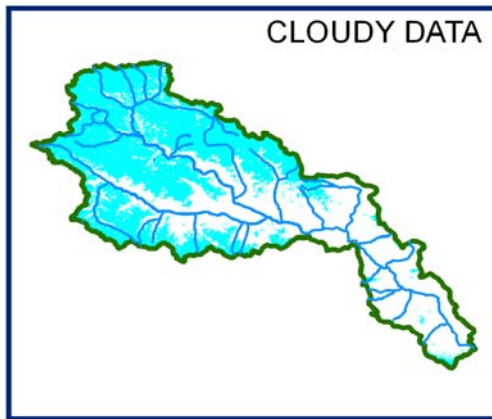
SHIGO BASIN



02 NOVEMBER 2013



DATA NOT AVAILABLE



11 NOVEMBER 2013



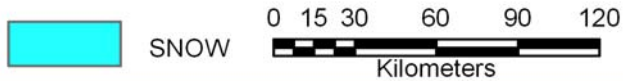
16 NOVEMBER 2013



21 NOVEMBER 2013



26 NOVEMBER 2013



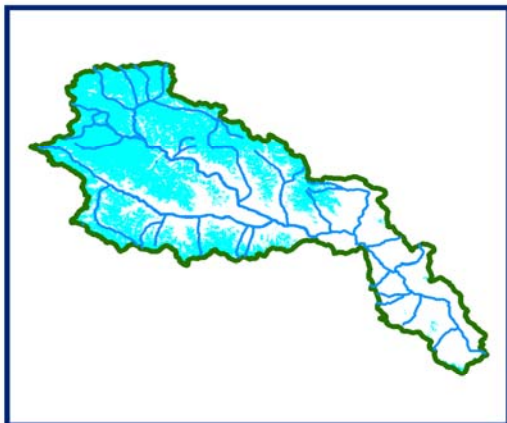
10 DAILY SNOW COVER MAP: SHIGO BASIN



DATA USED
02 NOVEMBER 2013



DATA USED
16 NOVEMBER 2013
20 NOVEMBER 2013



DATA USED
21 NOVEMBER 2013
26 NOVEMBER 2013
30 NOVEMBER 2013



SNOW



SNOW COVER MAP:

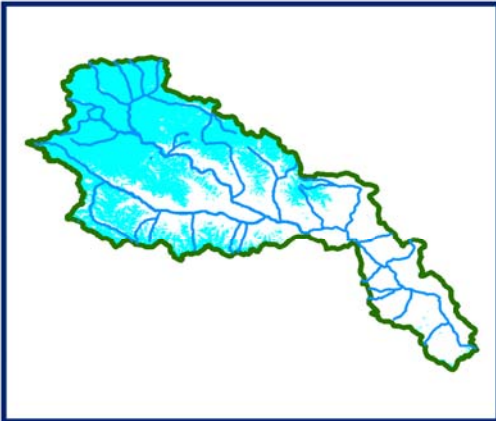
SHIGO BASIN



DATA NOT AVAILABLE



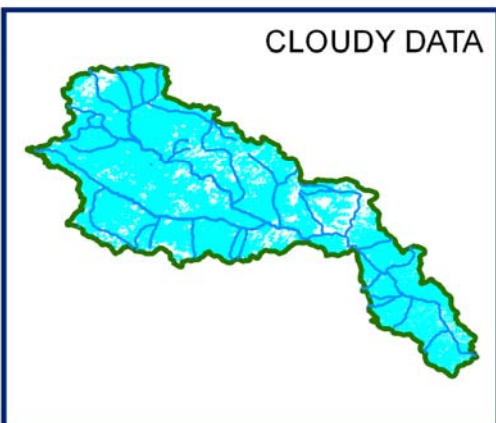
10 DECEMBER 2013



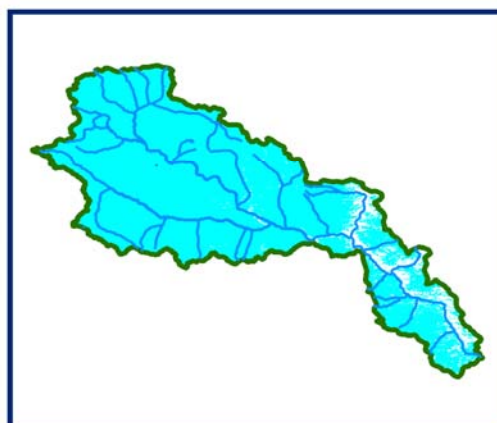
15 DECEMBER 2013



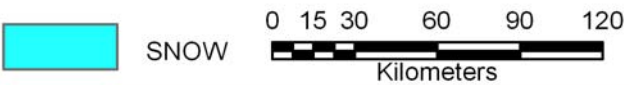
20 DECEMBER 2013



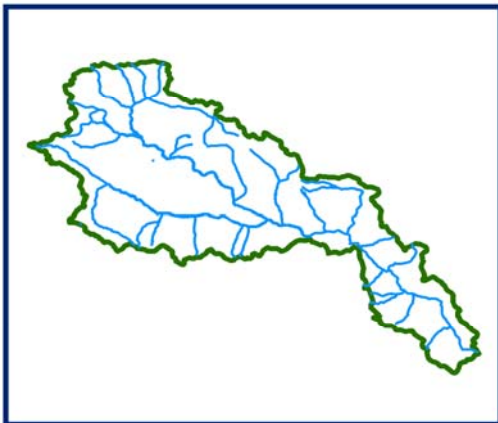
24 DECEMBER 2013



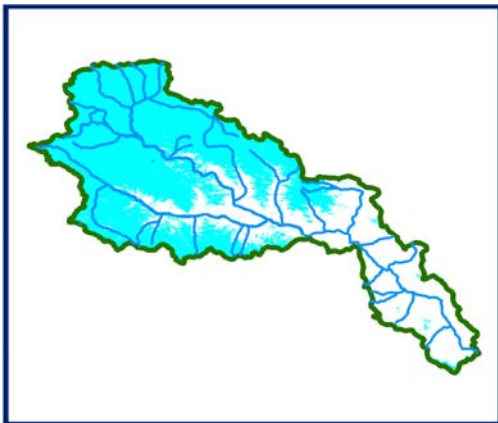
24 DECEMBER 2013



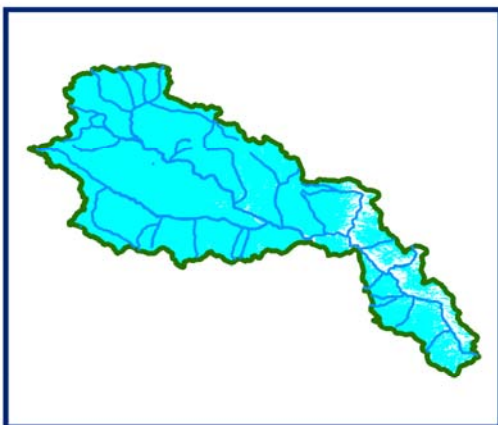
10 DAILY SNOW COVER MAP: SHIGO BASIN



DATA USED
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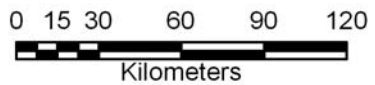
DATA USED
12 DECEMBER 2013
15 DECEMBER 2013



DATA USED
27 DECEMBER 2013



SNOW

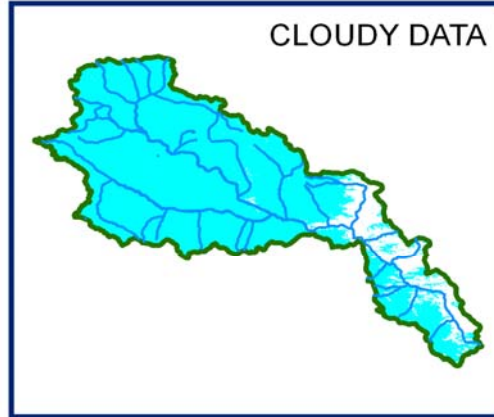


SNOW COVER MAP:

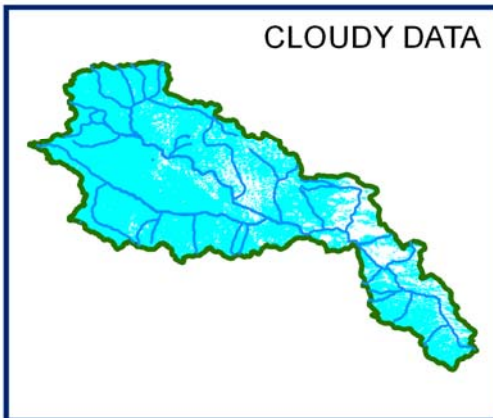
SHIGO BASIN



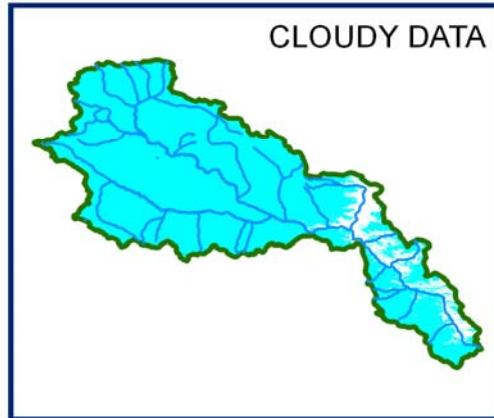
03 JANUARY 2014



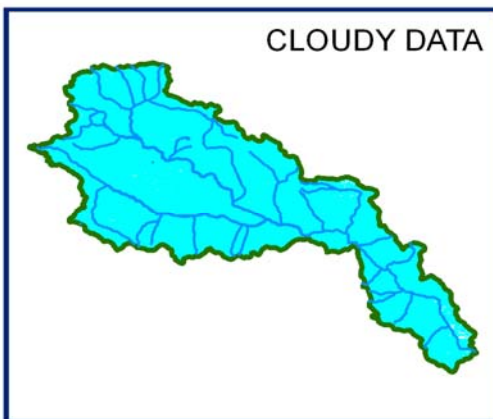
07 JANUARY 2014



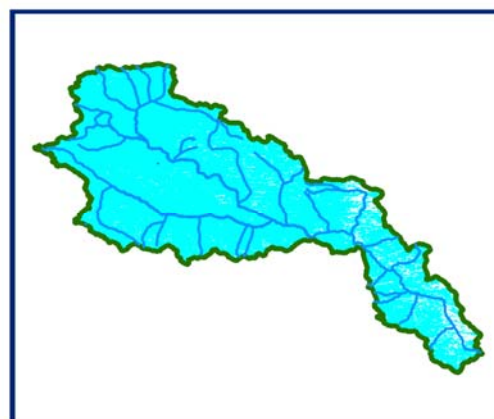
15 JANUARY 2014



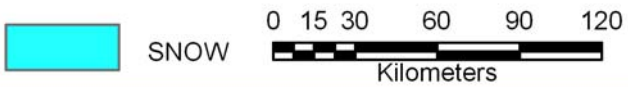
17 JANUARY 2014



24 JANUARY 2014



29 JANUARY 2014



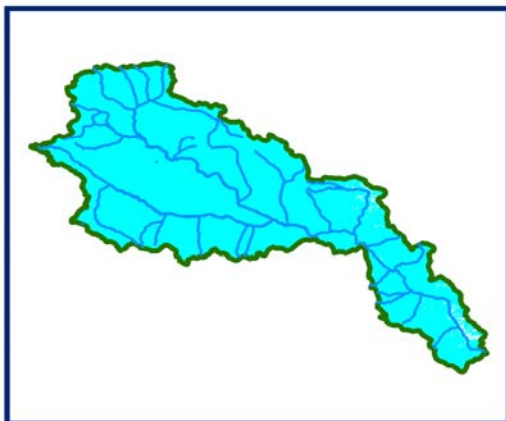
10 DAILY SNOW COVER MAP: SHIGO BASIN



DATA USED
03 JANUARY 2014



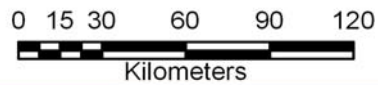
DATA USED
DATA NOT AVAILABLE



DATA USED
27 JANUARY 2014
29 JANUARY 2014

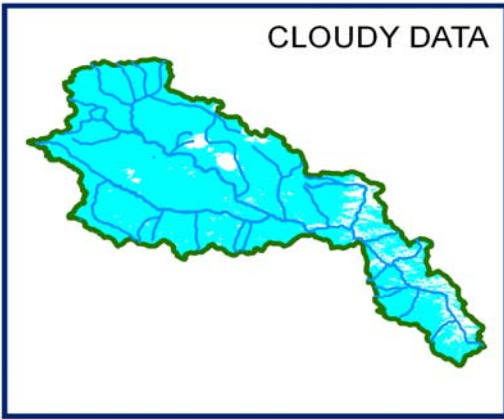


SNOW



SNOW COVER MAP:

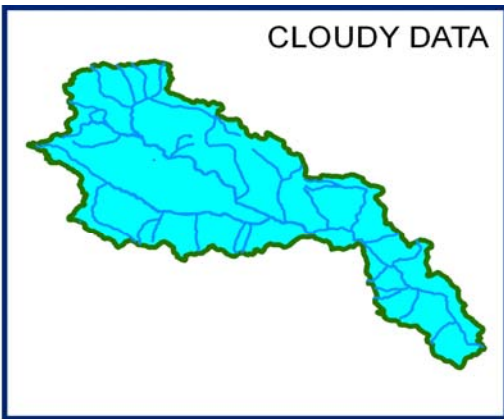
SHIGO BASIN



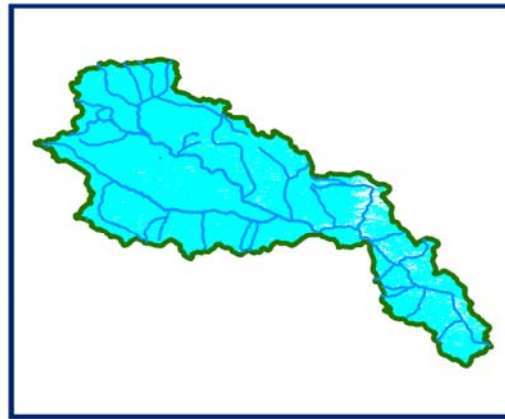
01 FEBRUARY 2014



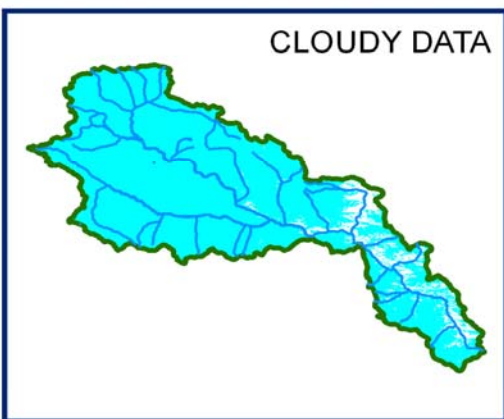
08 FEBRUARY 2014



15 FEBRUARY 2014



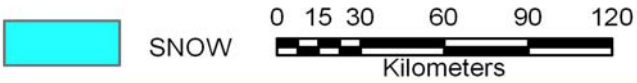
17 FEBRUARY 2014



25 FEBRUARY 2014



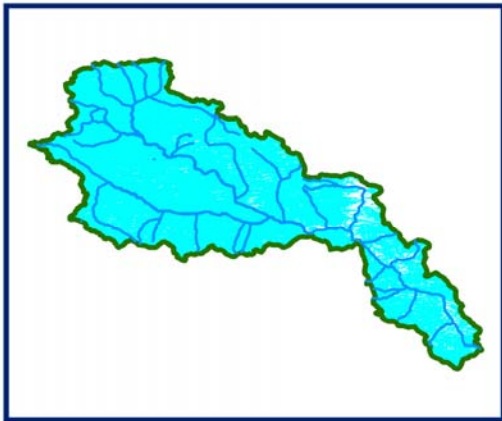
DATA NOT AVAILABLE



10 DAILY SNOW COVER MAP: SHIGO BASIN



DATA USED
08 FEBRUARY 2014



DATA USED
17 FEBRUARY 2014



DATA USED
DATA NOT AVAILABLE



SNOW



SNOW COVER MAP:

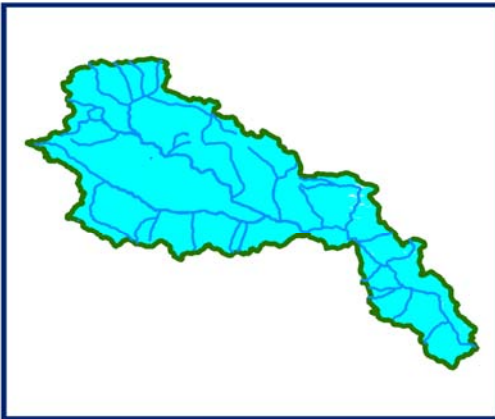
SHIGO BASIN



DATA NOT AVAILABLE



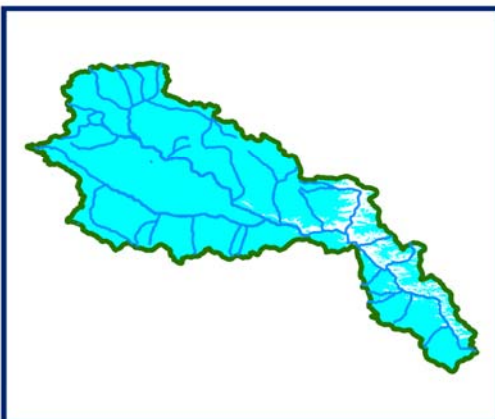
06 MARCH 2014



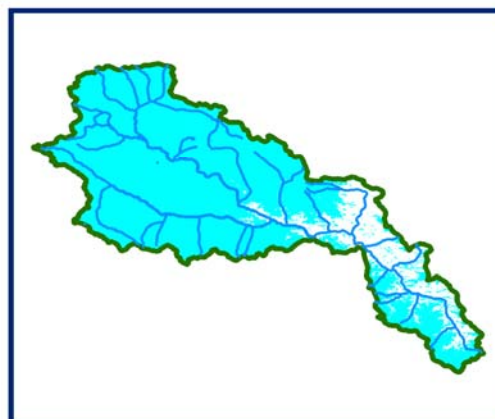
13 MARCH 2014



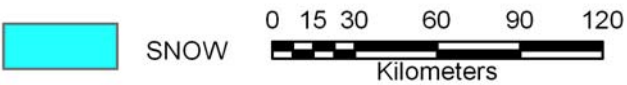
20 MARCH 2014



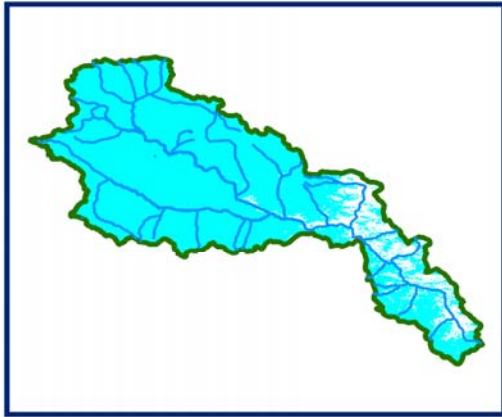
23 MARCH 2014



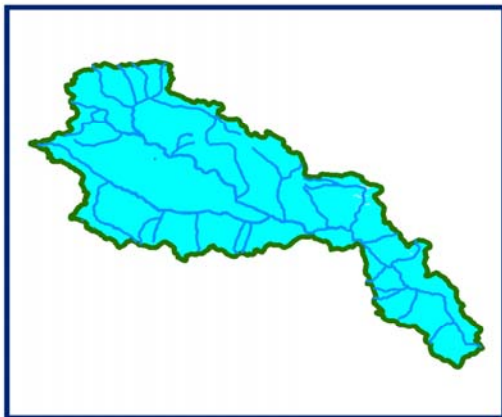
30 MARCH 2014



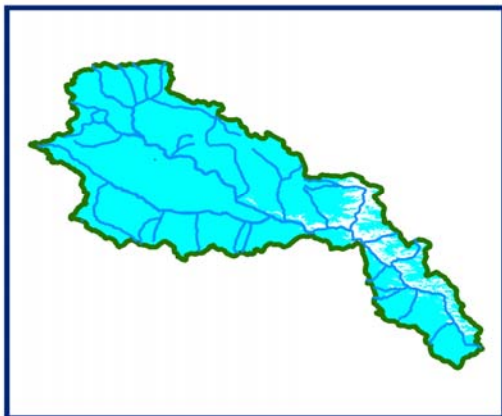
10 DAILY SNOW COVER MAP: SHIGO BASIN



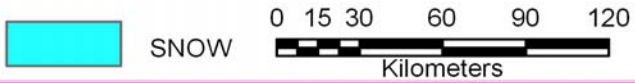
**DATA USED
06 MARCH 2014**



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



**DATA USED
23 MARCH 2014**



SNOW COVER MAP:

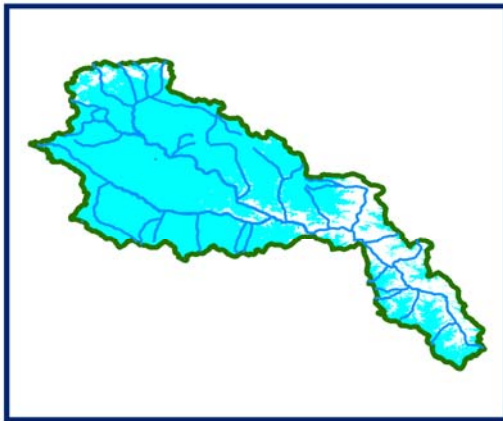
SHIGO BASIN



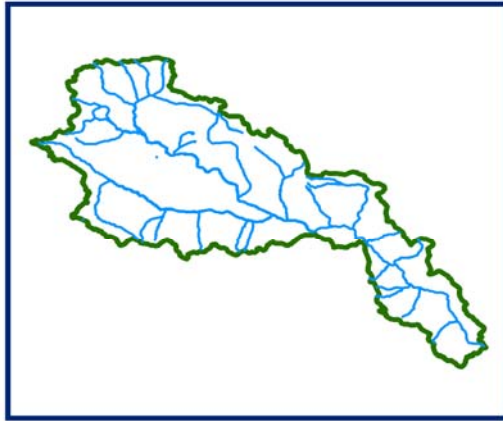
DATA NOT AVAILABLE



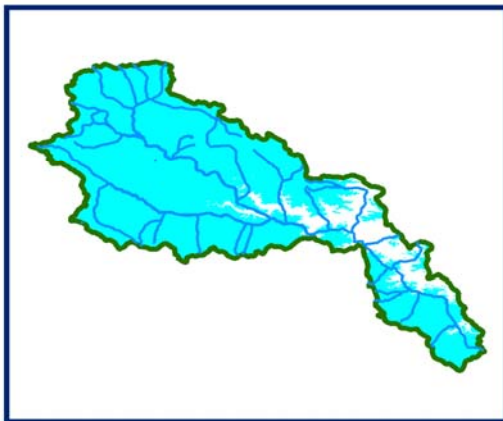
09 APRIL 2014



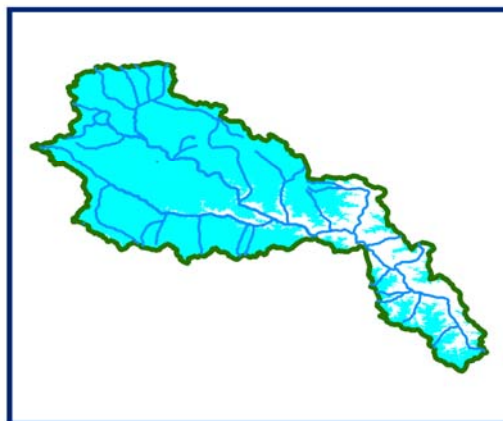
14 APRIL 2014



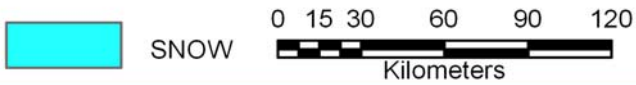
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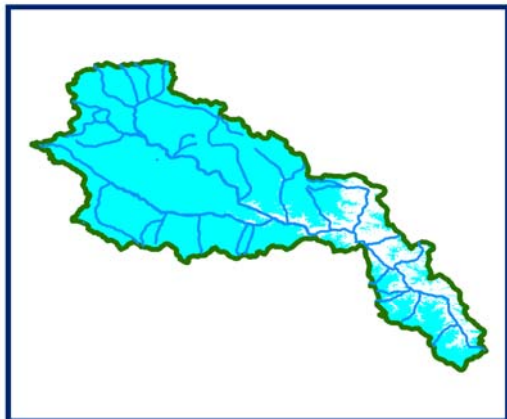
21 APRIL 2014



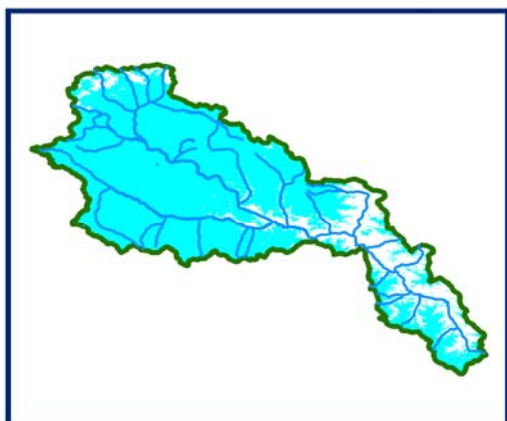
30 APRIL 2014



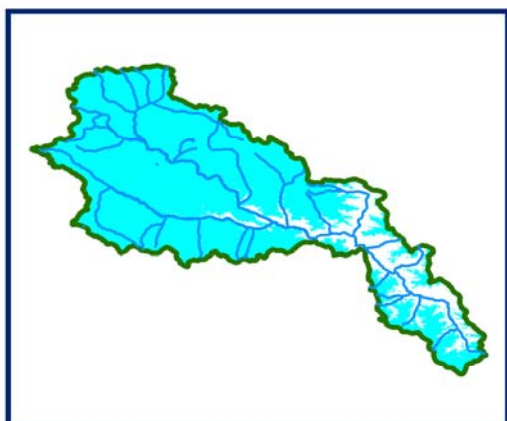
10 DAILY SNOW COVER MAP: SHIGO BASIN



DATA USED
09 APRIL 2014



DATA USED
14 APRIL 2014



DATA USED
28 APRIL 2014
30 APRIL 2014

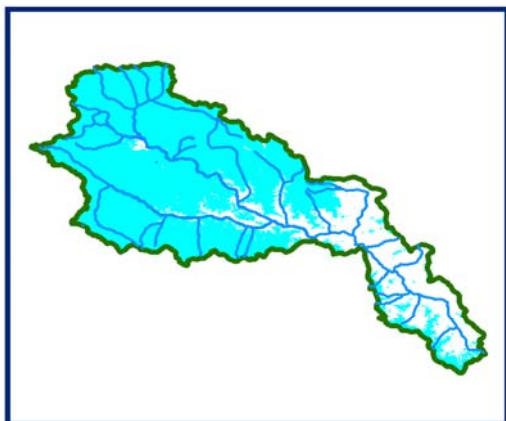


SNOW

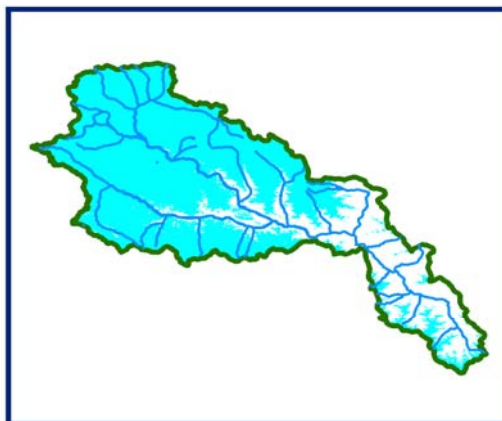


SNOW COVER MAP:

SHIGO BASIN



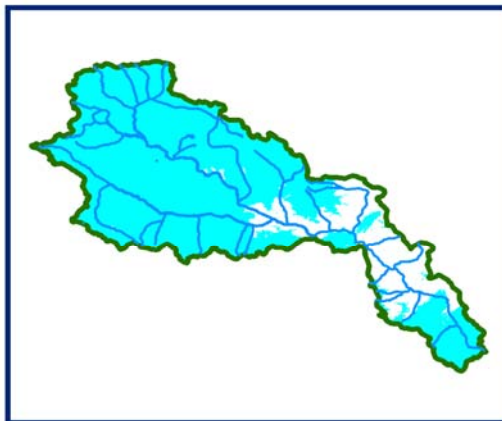
03 MAY 2014



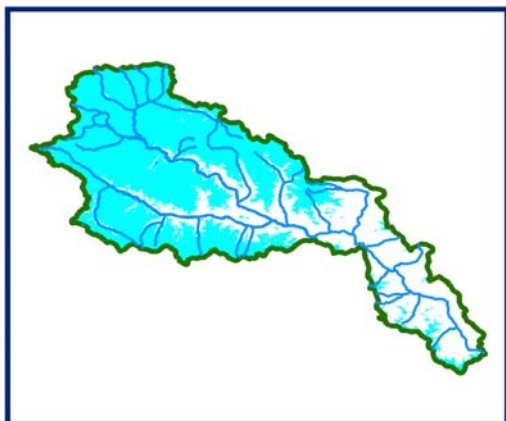
07 MAY 2014



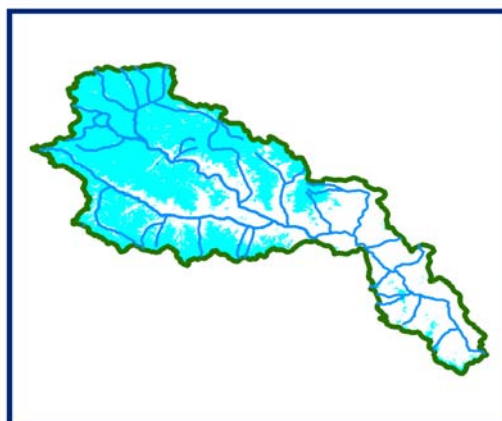
DATA NOT AVAILABLE



17 MAY 2014



24 MAY 2014



27 MAY 2014



SNOW



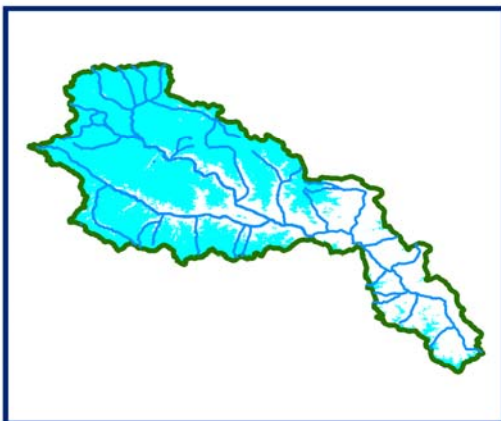
10 DAILY SNOW COVER MAP: SHIGO BASIN



DATA USED
07 MAY 2014



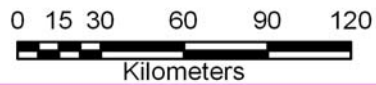
DATA USED
DATA NOT AVAILABLE



DATA USED
24 MAY 2014

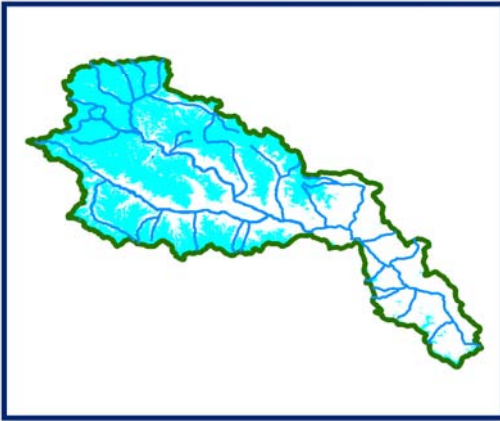


SNOW



SNOW COVER MAP:

SHIGO BASIN



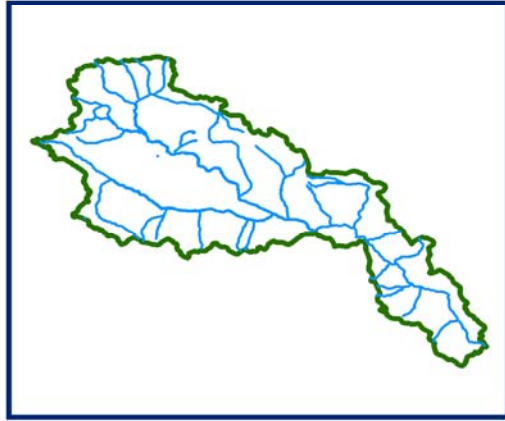
05 JUNE 2014



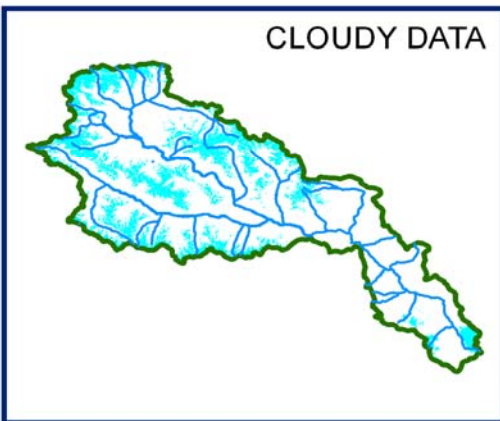
06 JUNE 2014



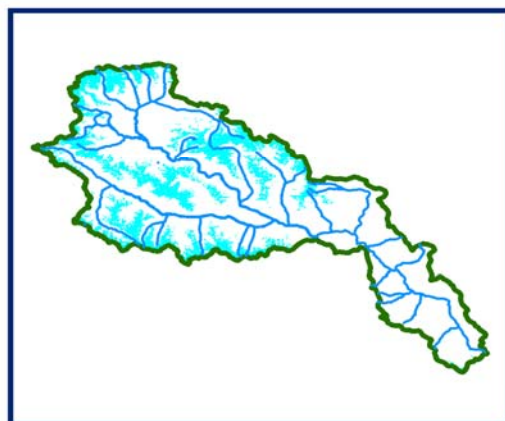
15 JUNE 2014



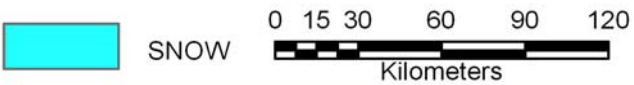
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25 JUNE 2014



27 JUNE 2014



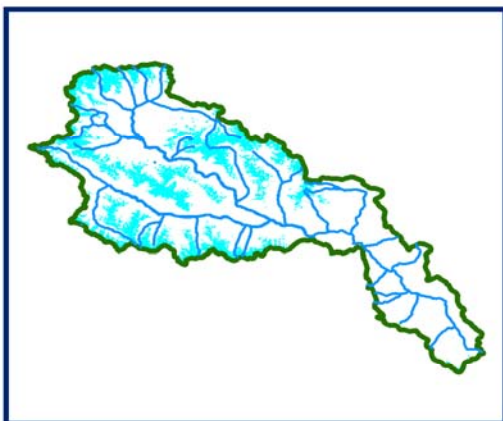
10 DAILY SNOW COVER MAP: SHIGO BASIN



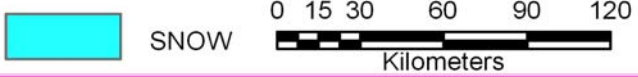
DATA USED
05 JUNE 2014
06 JUNE 2014



DATA USED
15 JUNE 2014



DATA USED
27 JUNE 2014



DRAS BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: DRAS

BASIN AREA: 1683 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	3-Oct-13	88	5	7	20-Oct-13	558	33
2	6-Oct-13	144	9	8	21-Oct-13	536	32
3	11-Oct-13	94	6	9	23-Oct-13	406	24
4	15-Oct-13	894	53	10	25-Oct-13	475	28
5	16-Oct-13	742	44	11	28-Oct-13	365	22
6	18-Oct-13	373	22				
November 2013							
12	1-Nov-13	1127	67	17	21-Nov-13	978	58
13	2-Nov-13	1235	73	18	25-Nov-13	898	53
14	11-Nov-13	1062	63	19	26-Nov-13	904	54
15	16-Nov-13	1093	65	20	30-Nov-13	841	50
16	20-Nov-13	1057	63				
December 2013							
21	10-Dec-13	1158	69	26	20-Dec-13	1399	83
22	12-Dec-13	1270	75	27	24-Dec-13	1417	84
23	14-Dec-13	670	40	28	26-Dec-13	1508	90
24	15-Dec-13	1048	62	29	27-Dec-13	1654	98
25	17-Dec-13	923	55				
January 2014							
30	3-Jan-14	1652	98	35	24-Jan-14	1657	98
31	5-Jan-14	1573	93	36	27-Jan-14	1656	98
32	7-Jan-14	1657	98	37	29-Jan-14	1647	98
33	15-Jan-14	1617	96	38	31-Jan-14	1655	98
34	17-Jan-14	1657	98				
February 2014							
39	1-Feb-14	1582	94	44	17-Feb-14	1653	98
40	6-Feb-14	1645	98	45	20-Feb-14	1561	93
41	8-Feb-14	1641	97	46	24-Feb-14	1654	98
42	10-Feb-14	1657	98	47	25-Feb-14	1657	98
43	15-Feb-14	1657	98				
March 2014							
48	6-Mar-14	1650	98	49	13-Mar-14	1657	98

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
50	16-Mar-14	1374	82	51	20-Mar-14	1657	98
52	21-Mar-14	1655	98	54	25-Mar-14	1384	82
53	23-Mar-14	1657	98	55	30-Mar-14	1645	98
April 2014							
56	9-Apr-14	1640	97	60	23-Apr-14	1552	92
57	13-Apr-14	1562	93	61	28-Apr-14	1565	93
58	14-Apr-14	1623	96	62	30-Apr-14	1568	93
59	21-Apr-14	1632	97				
May 2014							
63	3-May-14	1506	89	67	24-May-14	1295	77
64	7-May-14	1451	86	68	27-May-14	1166	69
65	10-May-14	1377	82	69	31-May-14	1012	60
66	22-May-14	1035	61				
June 2014							
70	1-Jun-14	1308	78	75	24-Jun-14	871	52
71	5-Jun-14	1278	76	76	25-Jun-14	801	48
72	6-Jun-14	1222	73	77	27-Jun-14	784	47
73	10-Jun-14	1021	61	78	29-Jun-14	629	37
74	15-Jun-14	1068	63				

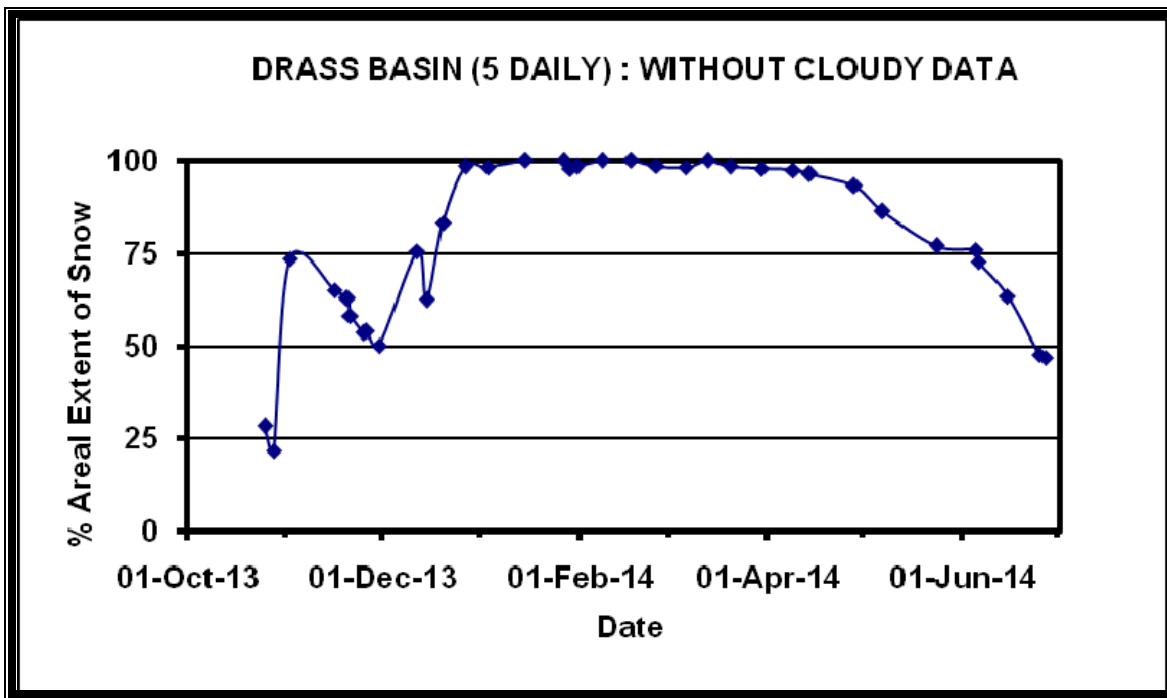
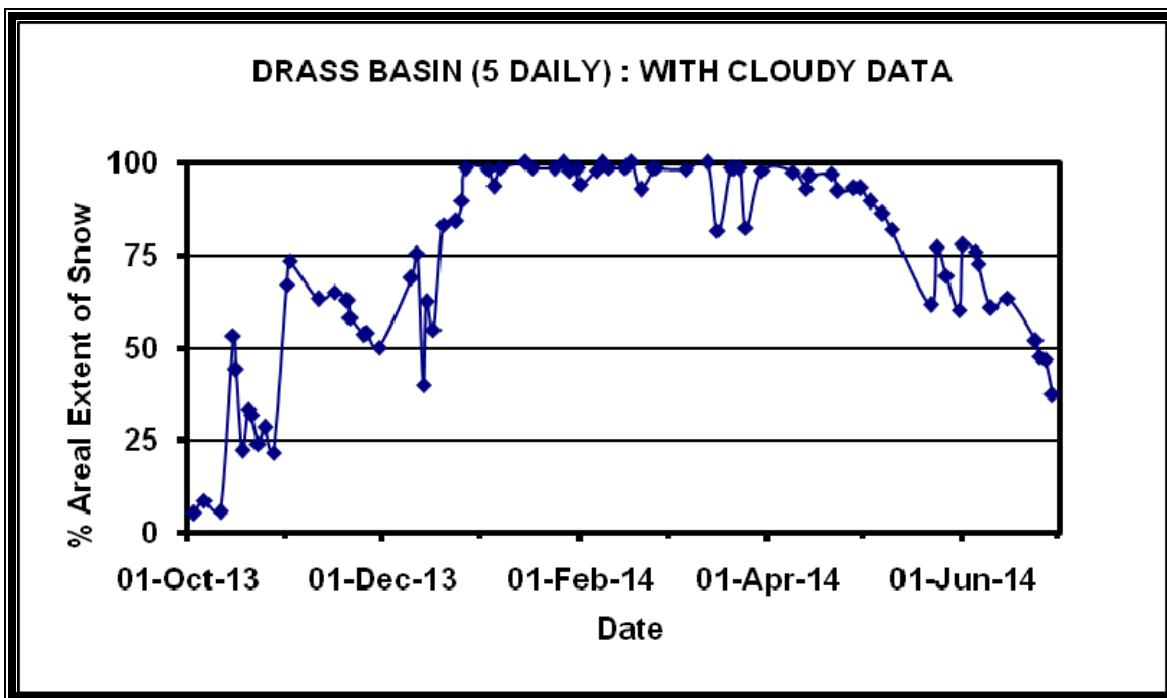
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: DRASS

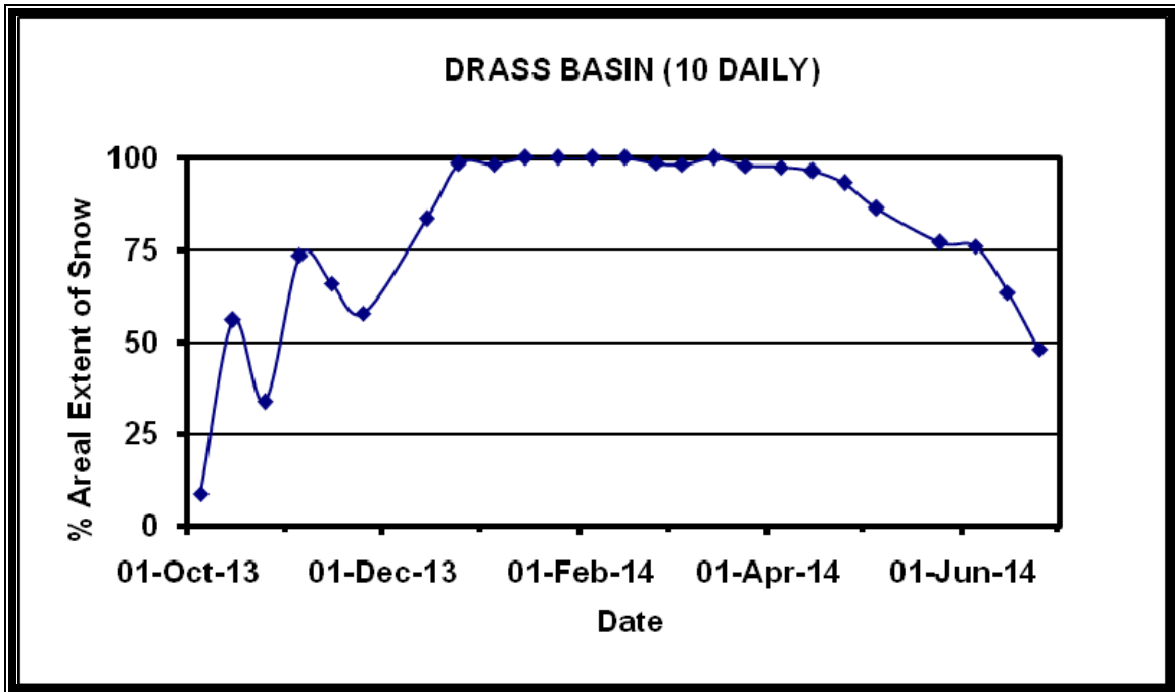
BASIN AREA: 1683 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S. No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	5-Oct-13	144	9	3	25-Oct-13	564	33
2	15-Oct-13	939	56				
November 2013							
4	15-Nov-13	1108	66	5	25-Nov-13	972	58
December 2013							
6	15-Dec-13	1403	83	7	25-Dec-13	1654	98
January 2014							
8	5-Jan-14	1652	98	9	25-Jan-14	1650	98
February 2014							
10	5-Feb-14	1641	97	12	25-Feb-14	1657	98
11	15-Feb-14	1653	98				
March 2014							
13	5-Mar-14	1650	98	15	25-Mar-14	1645	98
14	15-Mar-14	1657	98				
April 2014							
16	5-Apr-14	1640	97	18	25-Apr-14	1565	93
17	15-Apr-14	1623	96				
May 2014							
19	5-May-14	1451	86	20	25-May-14	1295	77
June 2014							
21	5-Jun-14	1182	70	23	25-Jun-14	805	48
22	15-Jun-14	1068	63				

Snow cover depletion curve



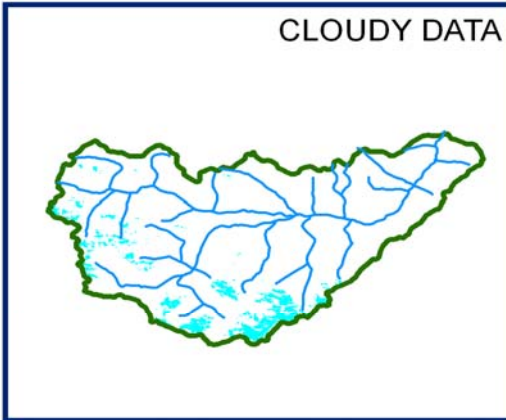
Snow cover depletion curve



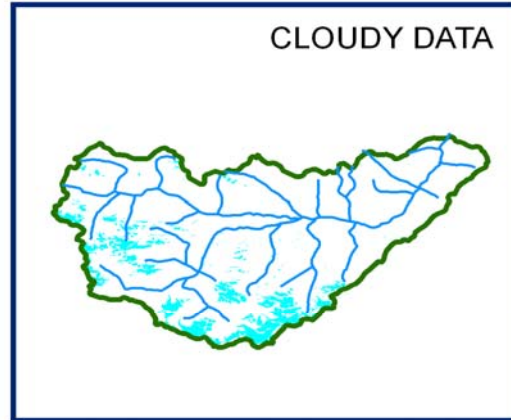
SNOW COVER MAP

SNOW COVER MAP:

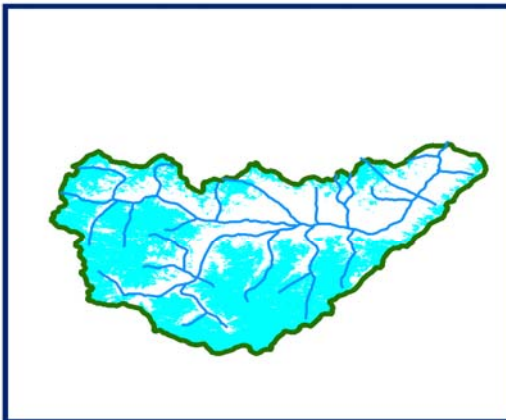
DRASS BASIN



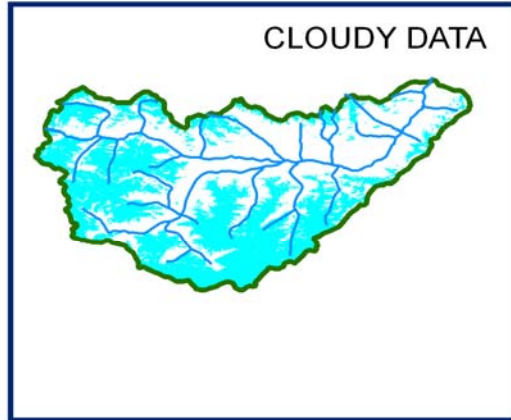
03 OCTOBER 2013



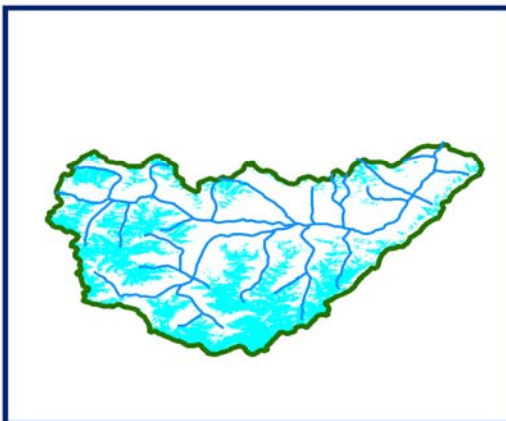
06 OCTOBER 2013



15 OCTOBER 2013



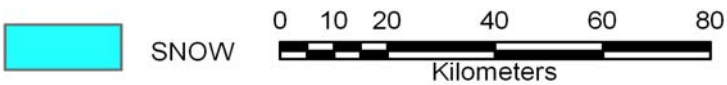
16 OCTOBER 2013



21 OCTOBER 2013



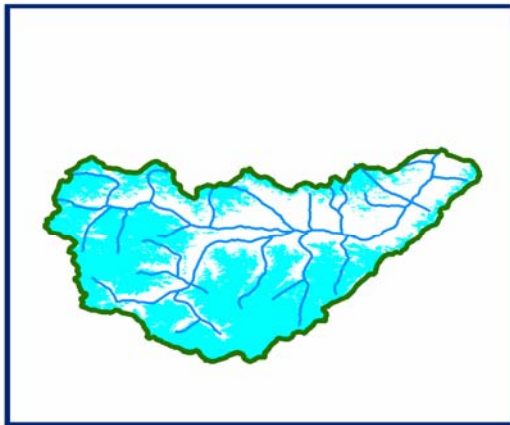
28 OCTOBER 2013



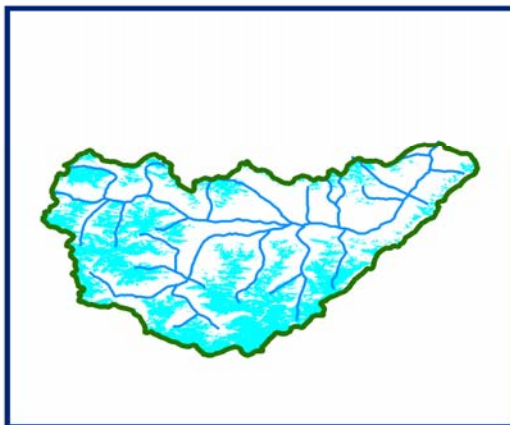
10 DAILY SNOW COVER MAP: DRASS BASIN



DATA USED
03 OCTOBER 2013



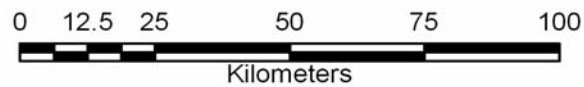
DATA USED
15 OCTOBER 2013
16 OCTOBER 2013



DATA USED
21 OCTOBER 2013
25 OCTOBER 2013
28 OCTOBER 2013

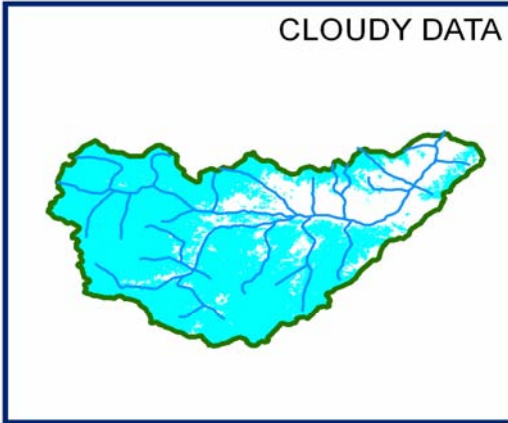


SNOW

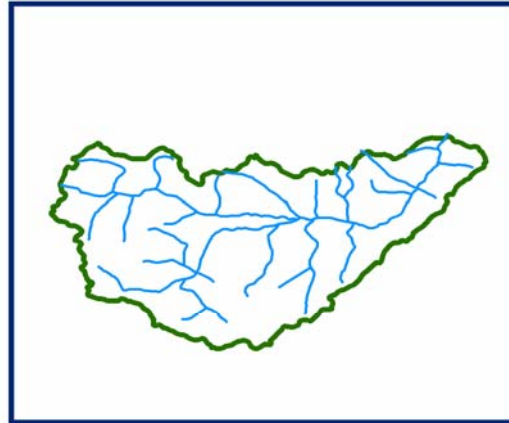


SNOW COVER MAP:

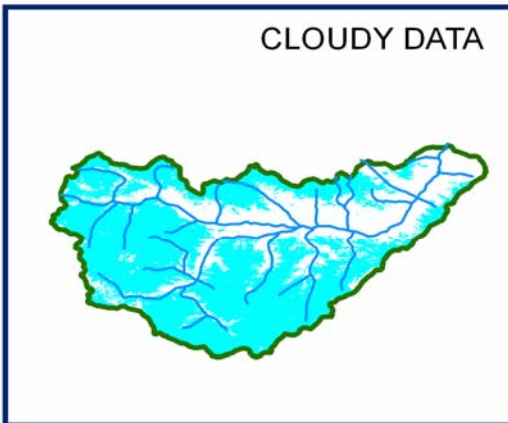
DRASS BASIN



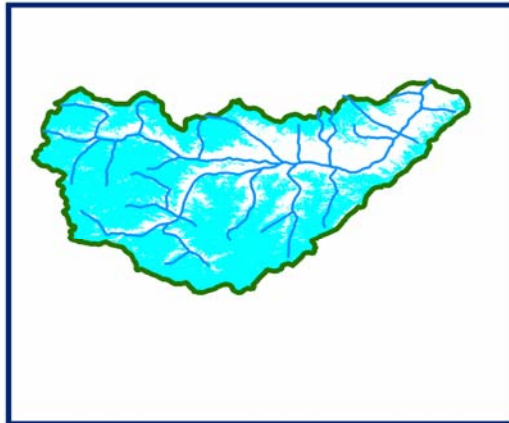
02 NOVEMBER 2013



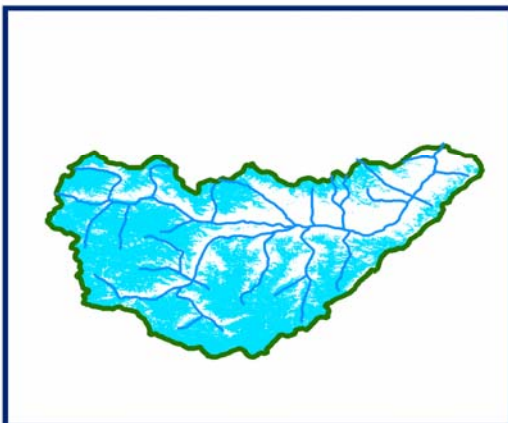
DATA NOT AVAILABLE



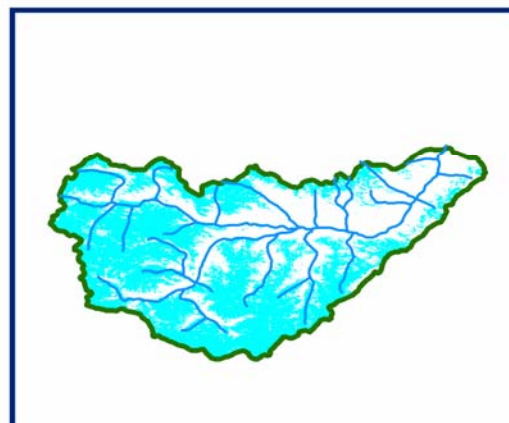
11 NOVEMBER 2013



16 NOVEMBER 2013



21 NOVEMBER 2013



26 NOVEMBER 2013



SNOW

0 10 20 40 60 80

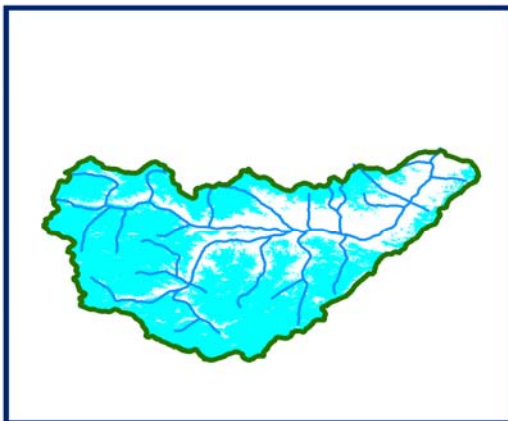


Kilometers

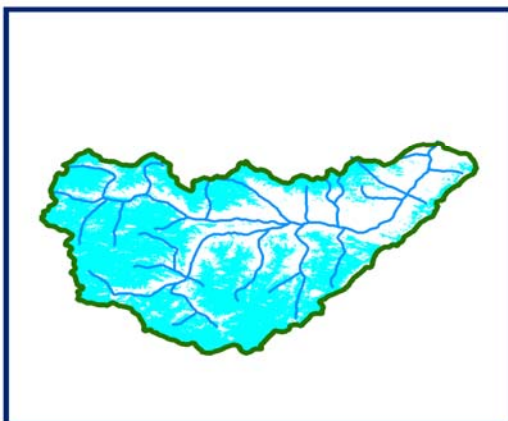
10 DAILY SNOW COVER MAP: DRASS BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
16 NOVEMBER 2013
20 NOVEMBER 2013



DATA USED
21 NOVEMBER 2013
25 NOVEMBER 2013
26 NOVEMBER 2013

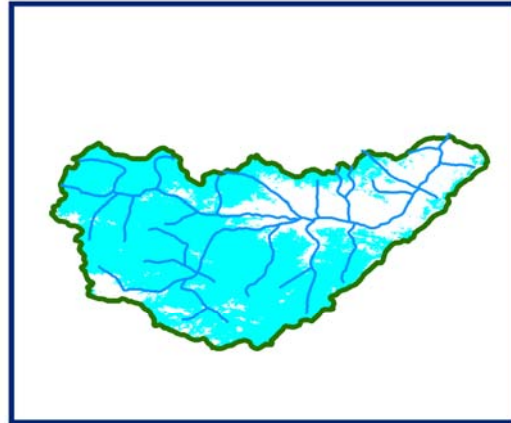


SNOW COVER MAP:

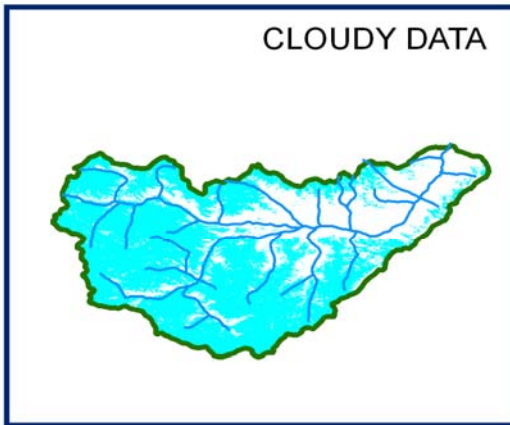
DRASS BASIN



DATA NOT AVAILABLE



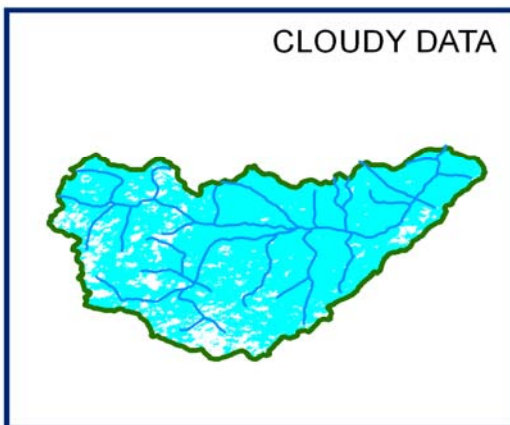
10 DECEMBER 2013



15 DECEMBER 2013



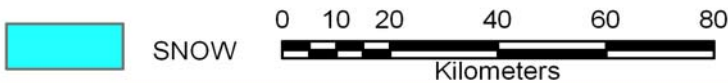
20 DECEMBER 2013



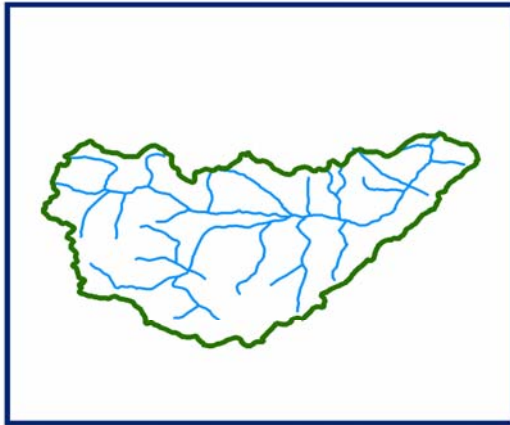
24 DECEMBER 2013



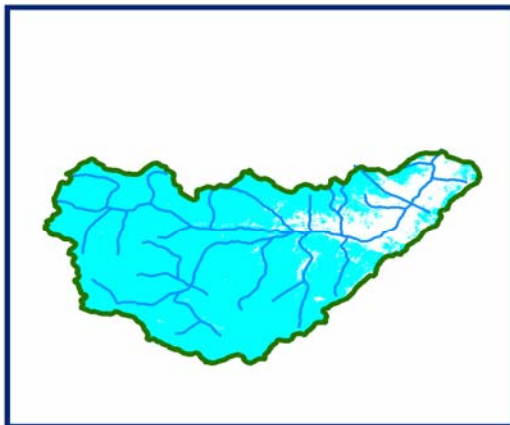
27 DECEMBER 2013



10 DAILY SNOW COVER MAP: DRASS BASIN



DATA USED
DATA NOT AVAILABLE



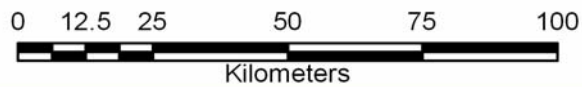
DATA USED
12 DECEMBER 2013
15 DECEMBER 2013



DATA USED
27 DECEMBER 2013



SNOW



SNOW COVER MAP:

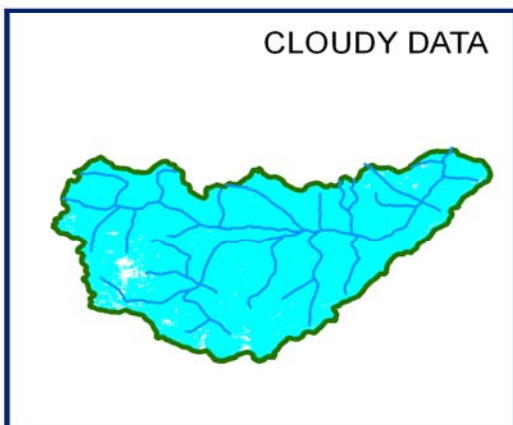
DRASS BASIN



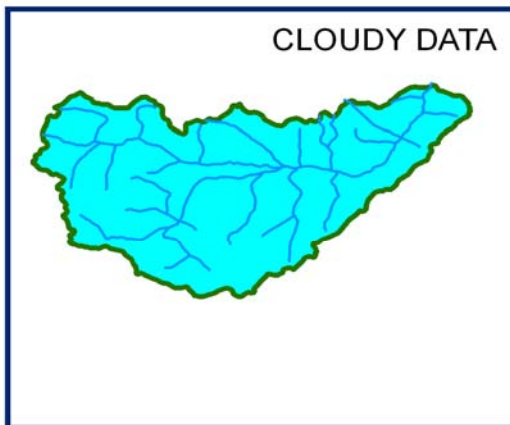
03 JANUARY 2014



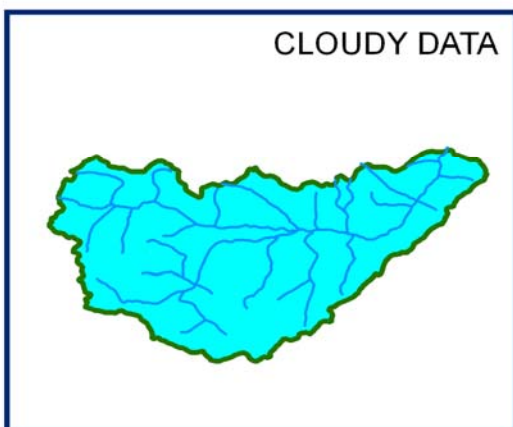
07 JANUARY 2014



15 JANUARY 2014



17 JANUARY 2014



24 JANUARY 2014



31 JANUARY 2014



SNOW

0 10 20 40 60 80

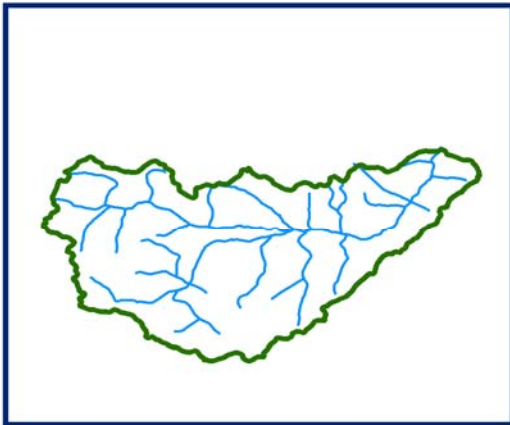


Kilometers

10 DAILY SNOW COVER MAP: DRASS BASIN



**DATA USED
03 JANUARY 2014**



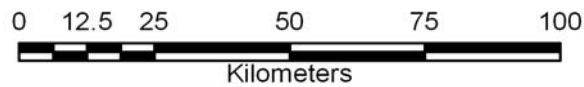
**DATA USED
DATA NOT AVAILABLE**



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

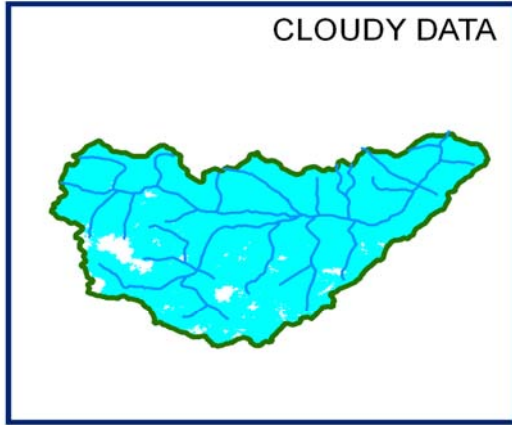


SNOW



SNOW COVER MAP:

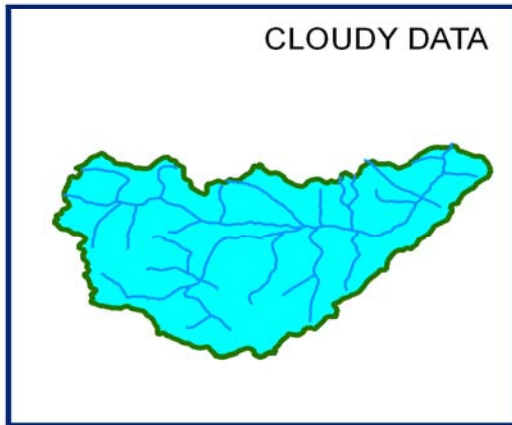
DRASS BASIN



01 FEBRUARY 2014



08 FEBRUARY 2014



15 FEBRUARY 2014



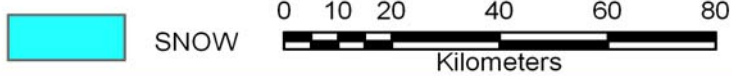
17 FEBRUARY 2014



25 FEBRUARY 2014



DATA NOT AVAILABLE



10 DAILY SNOW COVER MAP: DRASS BASIN



DATA USED
08 FEBRUARY 2014



DATA USED
17 FEBRUARY 2014



DATA USED
25 FEBRUARY 2014



SNOW



SNOW COVER MAP:

DRASS BASIN



DATA NOT AVAILABLE



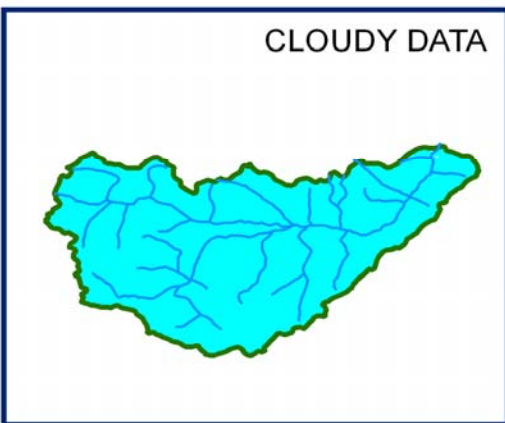
06 MARCH 2014



13 MARCH 2014



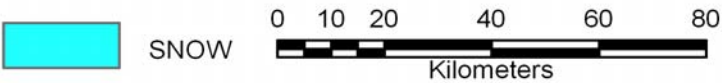
20 MARCH 2014



23 MARCH 2014



30 MARCH 2014



10 DAILY SNOW COVER MAP: DRASS BASIN



**DATA USED
06 MARCH 2014**



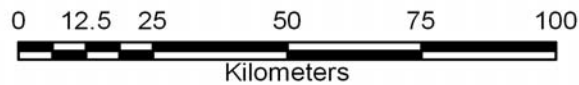
**DATA USED
13 MARCH 2014
20 MARCH 2014**



**DATA USED
30 MARCH 2014**



SNOW



SNOW COVER MAP:

DRASS BASIN



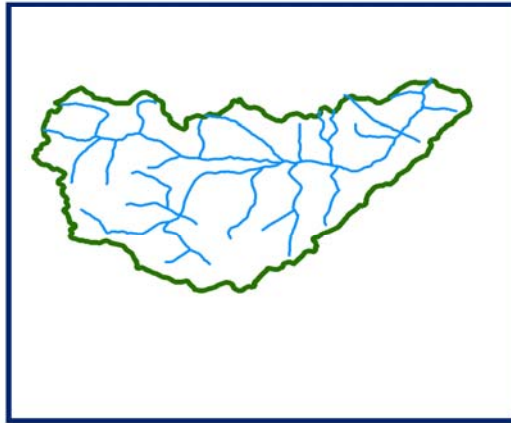
DATA NOT AVAILABLE



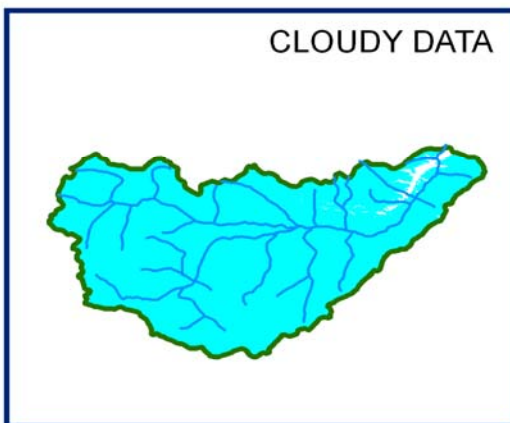
09 APRIL 2014



14 APRIL 2014



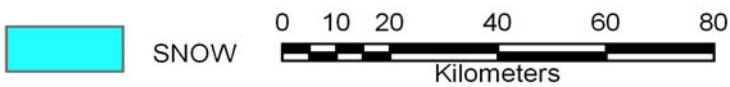
DATA NOT AVAILABLE



21 APRIL 2014



28 APRIL 2014



10 DAILY SNOW COVER MAP: DRASS BASIN



**DATA USED
09 APRIL 2014**



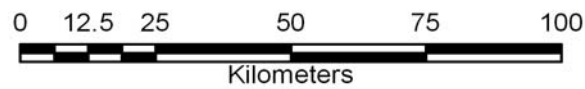
**DATA USED
14 APRIL 2014**



**DATA USED
28 APRIL 2014**

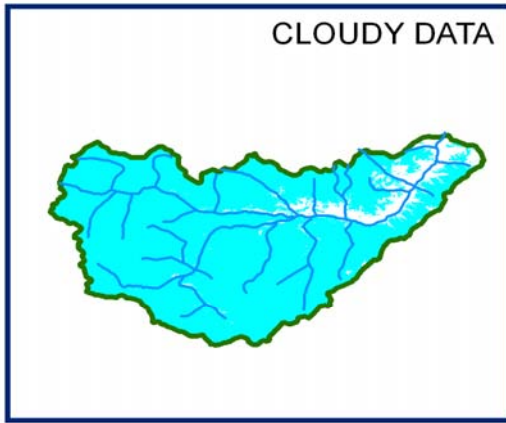


SNOW



SNOW COVER MAP:

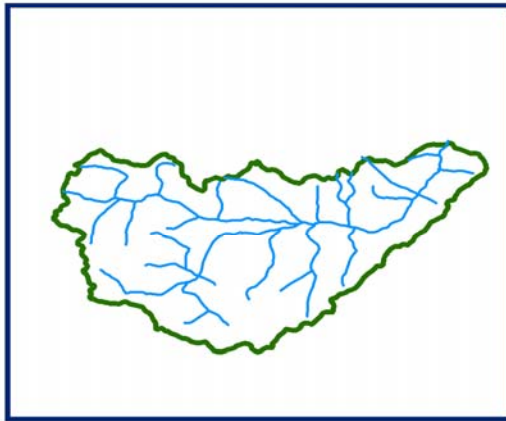
DRASS BASIN



03 MAY 2014



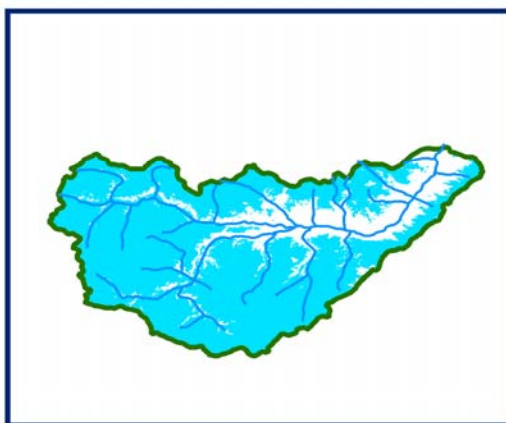
07 MAY 2014



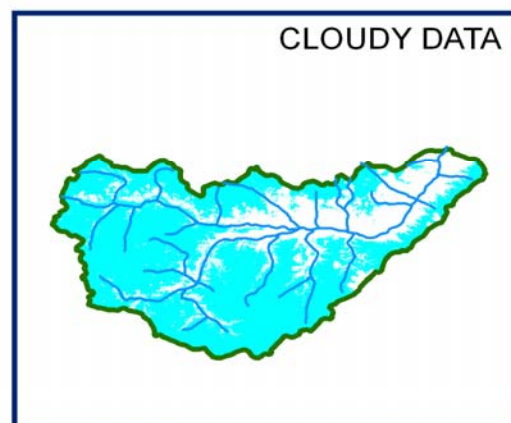
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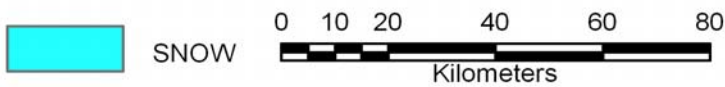
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24 MAY 2014



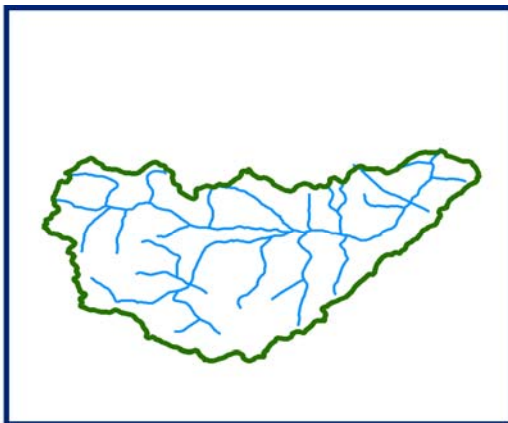
27 MAY 2014



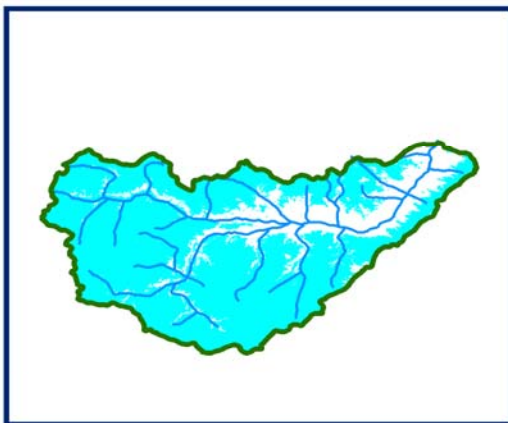
10 DAILY SNOW COVER MAP: DRASS BASIN



**DATA USED
07 MAY 2014**



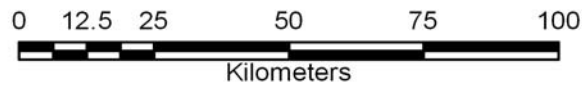
**DATA USED
DATA NOT AVAILABLE**



**DATA USED
24 MAY 2014**



SNOW



SNOW COVER MAP:

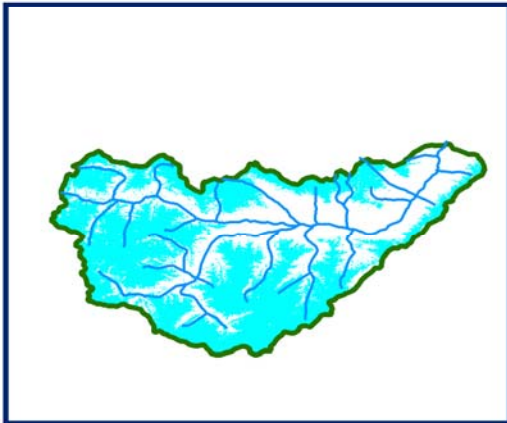
DRASS BASIN



05 JUNE 2014



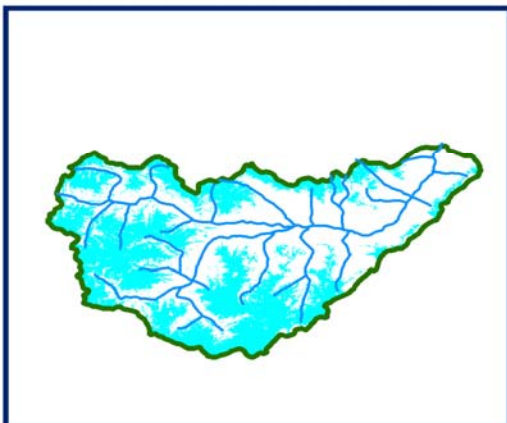
06 JUNE 2014



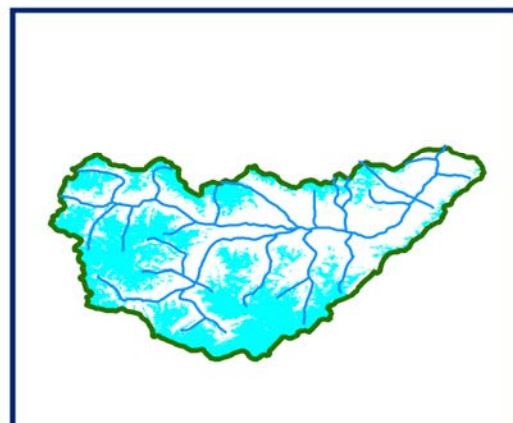
15 JUNE 2014



DATA NOT AVAILABLE



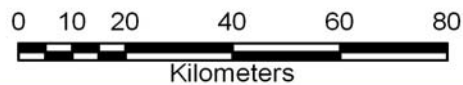
25 JUNE 2014



27 JUNE 2014



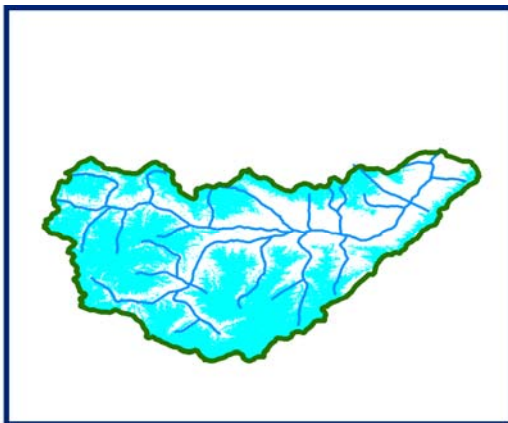
SNOW



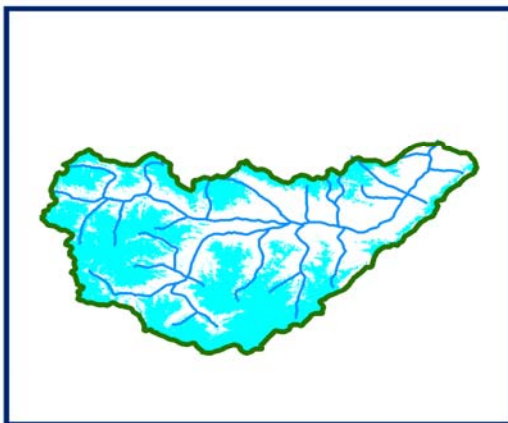
10 DAILY SNOW COVER MAP: DRASS BASIN



DATA USED
05 JUNE 2014
06 JUNE 2014



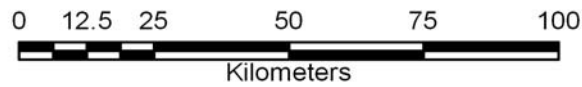
DATA USED
15 JUNE 2014



DATA USED
25 JUNE 2014
27 JUNE 2014



SNOW



SURU BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: SURU

BASIN AREA: 3575 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	3-Oct-13	358	10	6	18-Oct-13	1132	32
2	6-Oct-13	529	15	7	21-Oct-13	1318	37
3	11-Oct-13	443	12	8	23-Oct-13	1065	30
4	15-Oct-13	2098	59	9	25-Oct-13	1175	33
5	16-Oct-13	1793	50	10	28-Oct-13	892	25
November 2013							
11	1-Nov-13	2440	68	16	21-Nov-13	1815	51
12	2-Nov-13	2247	63	17	25-Nov-13	1467	41
13	11-Nov-13	1887	53	18	26-Nov-13	1560	44
14	16-Nov-13	2002	56	19	30-Nov-13	1376	38
15	20-Nov-13	1918	54				
December 2013							
20	10-Dec-13	2055	57	24	20-Dec-13	2087	58
21	14-Dec-13	1055	29	25	24-Dec-13	2849	80
22	15-Dec-13	1705	48	26	26-Dec-13	3300	92
23	17-Dec-13	1488	42				
January 2014							
27	3-Jan-14	3371	94	31	24-Jan-14	3555	99
28	7-Jan-14	2909	81	32	27-Jan-14	3543	99
29	15-Jan-14	3471	97	33	29-Jan-14	3508	98
30	17-Jan-14	3540	99	34	31-Jan-14	3520	98
February 2014							
35	1-Feb-14	3341	93	40	17-Feb-14	3539	99
36	6-Feb-14	3251	91	41	20-Feb-14	3475	97
37	8-Feb-14	3480	97	42	24-Feb-14	3490	98
38	10-Feb-14	3553	99	43	25-Feb-14	3543	99
39	15-Feb-14	3562	100				
March 2014							
44	6-Mar-14	3480	97	48	21-Mar-14	3522	99
45	13-Mar-14	3557	99	49	25-Mar-14	3242	91
46	16-Mar-14	3210	90	50	26-Mar-14	3530	99
47	20-Mar-14	3543	99	51	30-Mar-14	3477	97

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
April 2014							
52	9-Apr-14	3465	97	56	23-Apr-14	3271	91
53	13-Apr-14	3263	91	57	28-Apr-14	3256	91
54	14-Apr-14	3380	95	58	30-Apr-14	3307	93
55	21-Apr-14	3465	97				
May 2014							
59	3-May-14	3106	87	63	22-May-14	1900	53
60	7-May-14	3036	85	64	24-May-14	2663	74
61	10-May-14	2211	62	65	25-May-14	2650	74
62	17-May-14	3441	96	66	27-May-14	2449	69
June 2014							
67	1-Jun-14	2510	70	71	15-Jun-14	1963	55
68	5-Jun-14	2317	65	72	25-Jun-14	1087	30
69	6-Jun-14	2223	62	73	27-Jun-14	1361	38
70	10-Jun-14	1775	50	74	29-Jun-14	1269	35

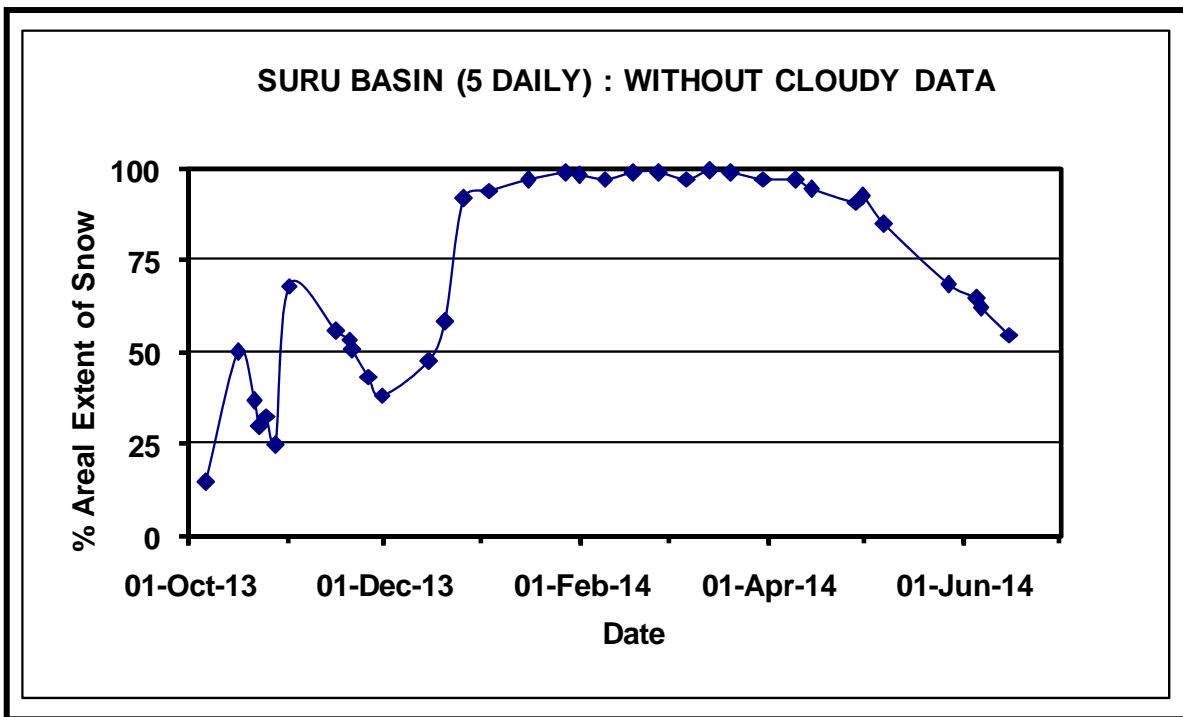
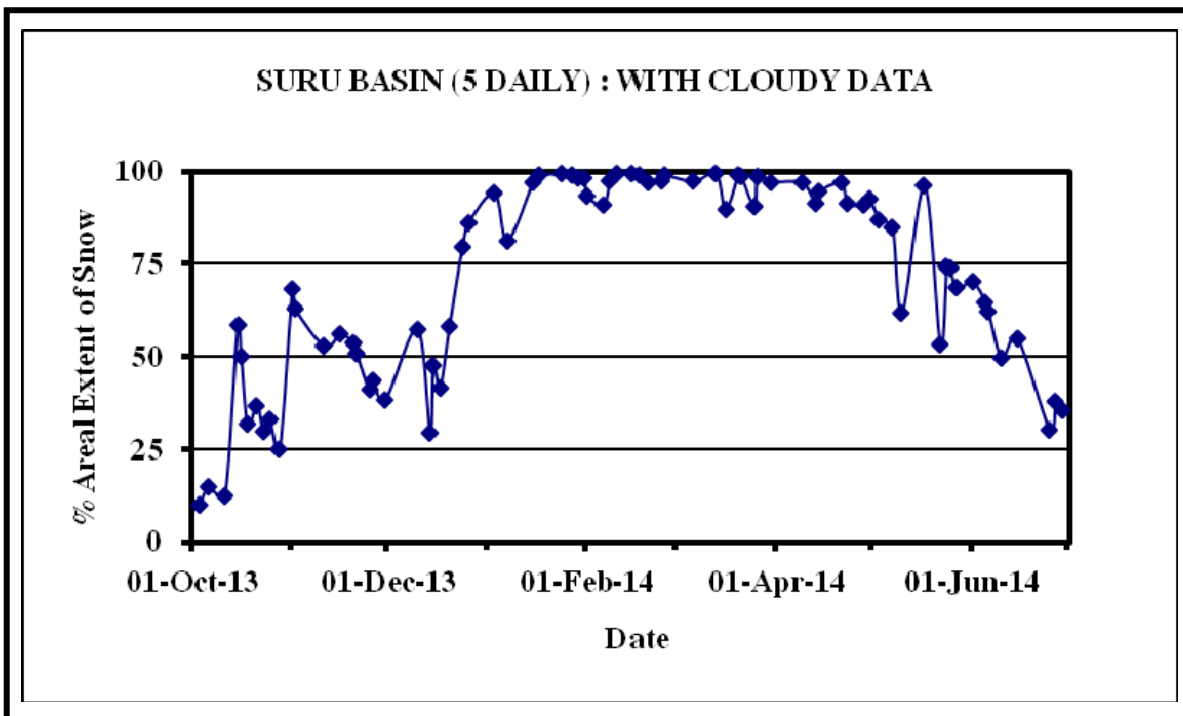
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: SURU

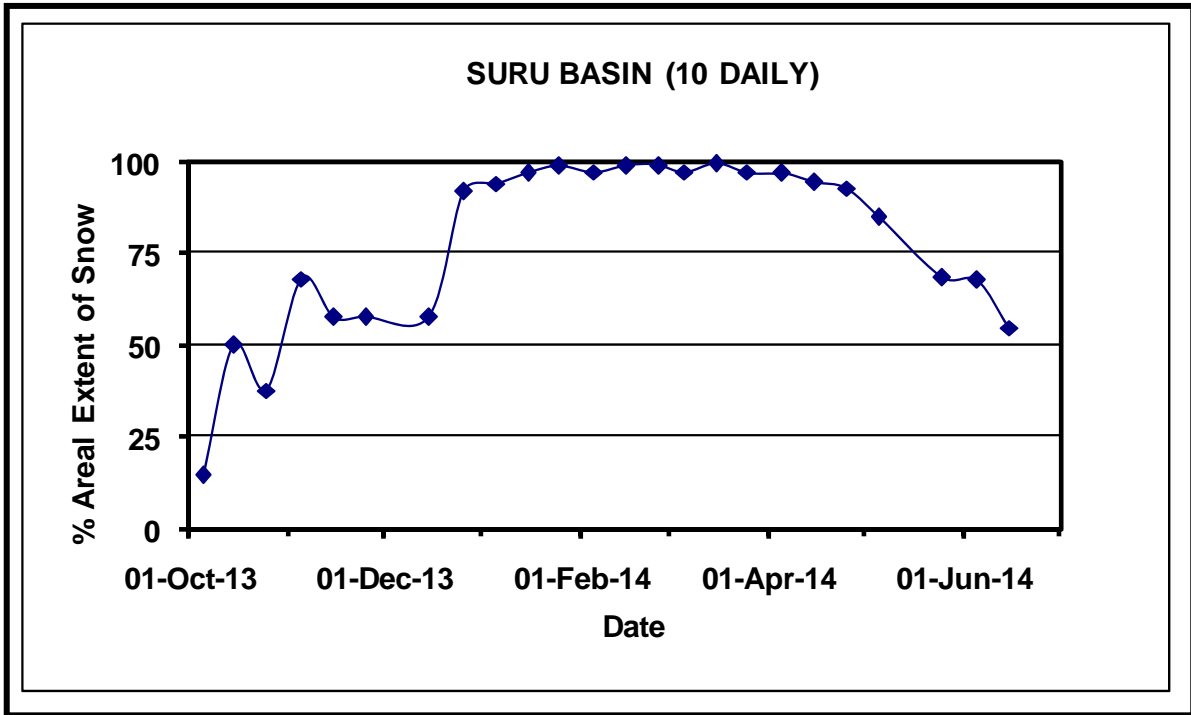
BASIN AREA: 3575 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	5-Oct-13	529	15	3	25-Oct-13	1358	37
2	15-Oct-13	1788	50				
November 2013							
4	5-Nov-13	2440	68	6	25-Nov-13	2073	58
5	15-Nov-13	2066	58				
December 2013							
7	15-Dec-13	2073	58		25-Dec-13	3289	92
January 2014							
8	5-Jan-14	3371	94	10	25-Jan-14	3544	99
9	15-Jan-14	3471	97				
February 2014							
11	5-Feb-14	3480	97		25-Feb-14	3543	99
12	15-Feb-14	3539	99				
March 2014							
13	5-Mar-14	3480	97	15	25-Mar-14	3477	97
14	15-Mar-14	3562	100				
April 2014							
16	5-Apr-14	3465	97	18	25-Apr-14	3325	93
17	15-Apr-14	3380	95				
May 2014							
19	5-May-14	3036	85	20	25-May-14	2449	69
June 2014							
21	5-Jun-14	2421	68	22	15-Jun-14	1963	55

Snow cover depletion curve



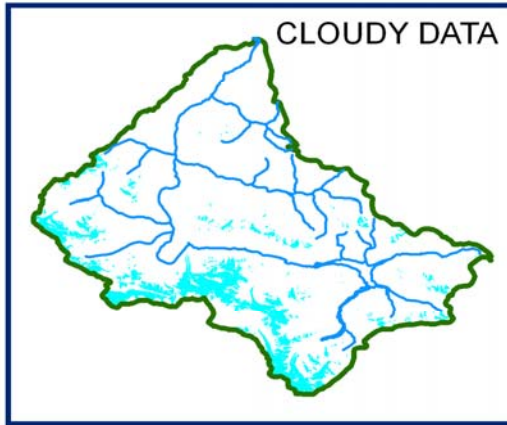
Snow cover depletion curve



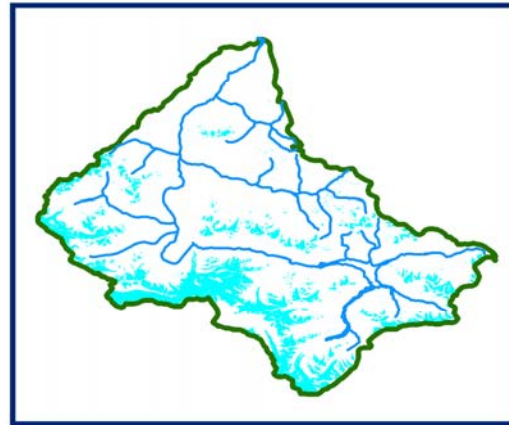
SNOW COVER MAP

SNOW COVER MAP:

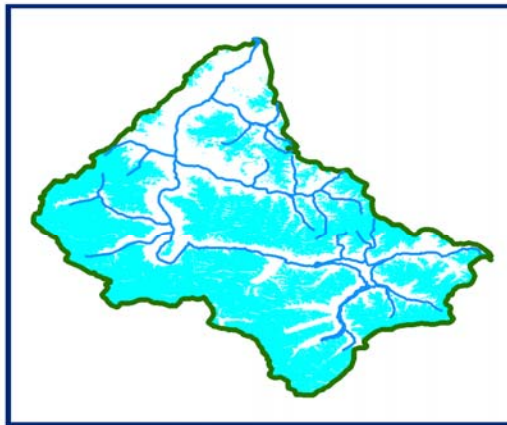
SURU BASIN



03 OCTOBER 2013



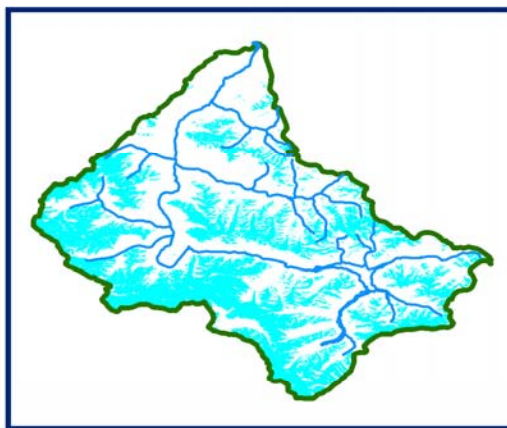
06 OCTOBER 2013



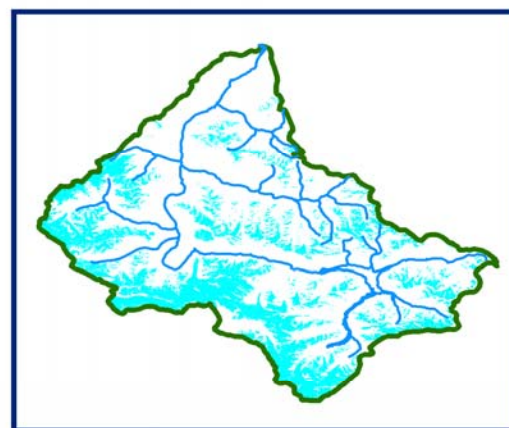
15 OCTOBER 2013



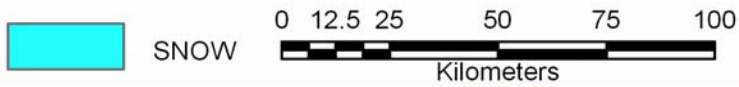
16 OCTOBER 2013



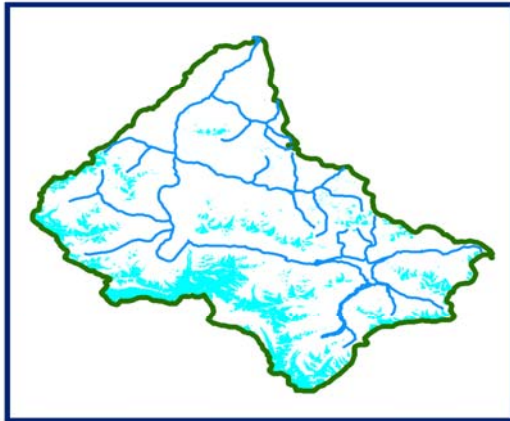
21 OCTOBER 2013



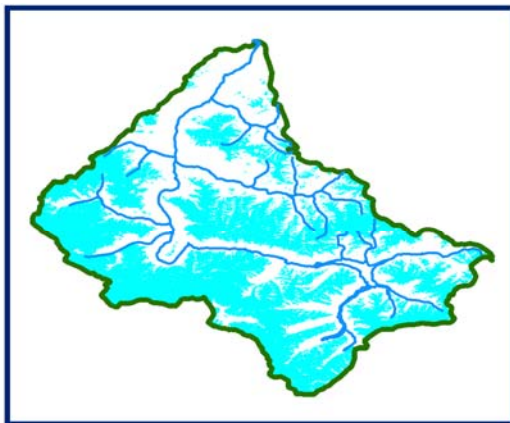
28 OCTOBER 2013



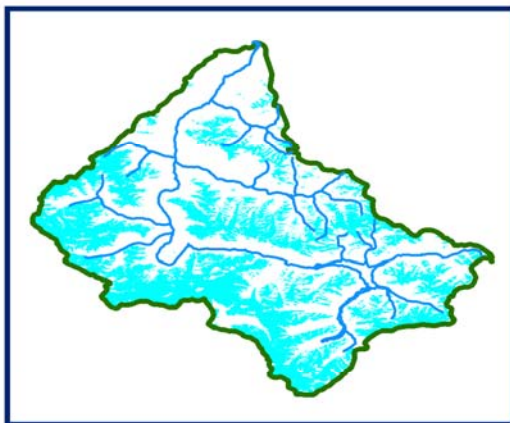
10 DAILY SNOW COVER MAP: SURU BASIN



DATA USED
06 OCTOBER 2013



DATA USED
16 OCTOBER 2013



DATA USED
21 OCTOBER 2013
23 OCTOBER 2013
25 OCTOBER 2013

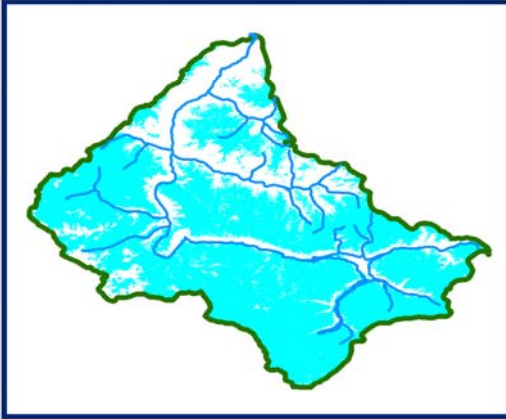


SNOW

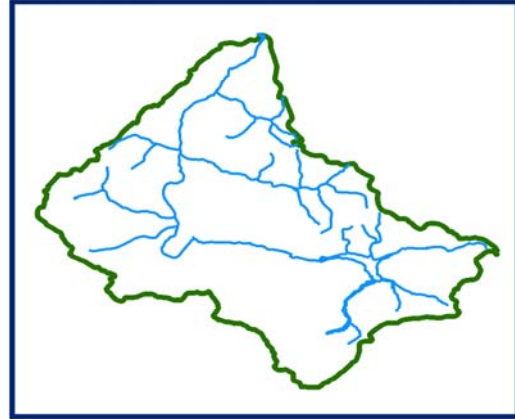


SNOW COVER MAP:

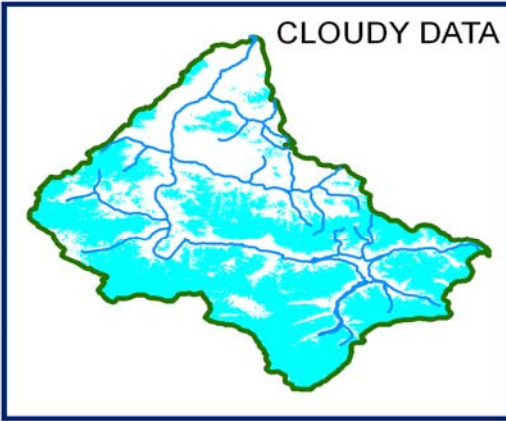
SURU BASIN



01 NOVEMBER 2013



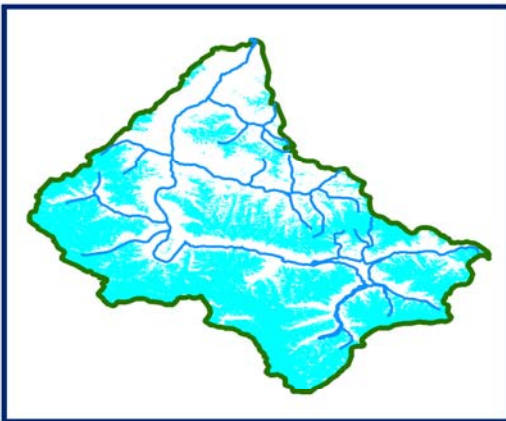
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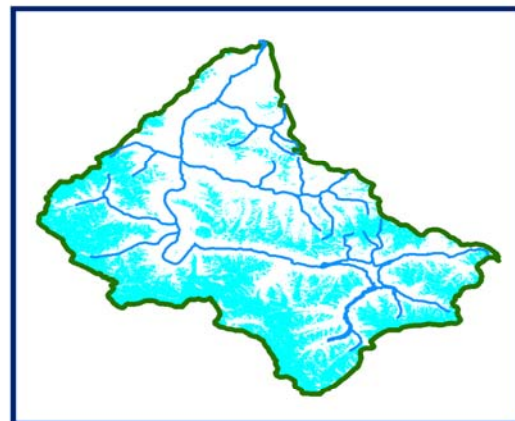
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16 NOVEMBER 2013



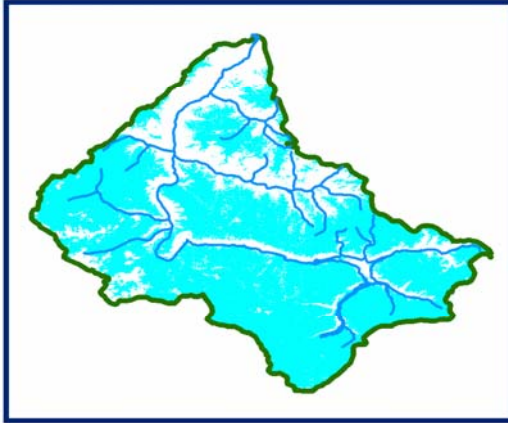
21 NOVEMBER 2013



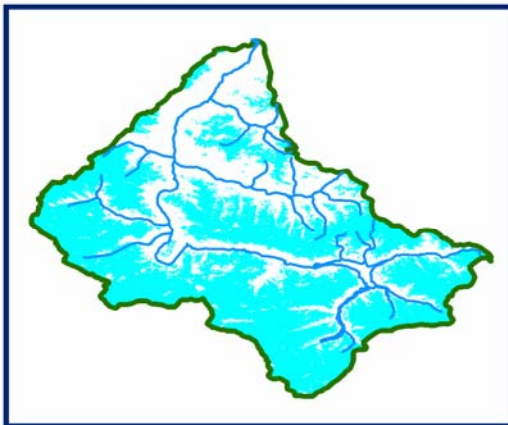
30 NOVEMBER 2013



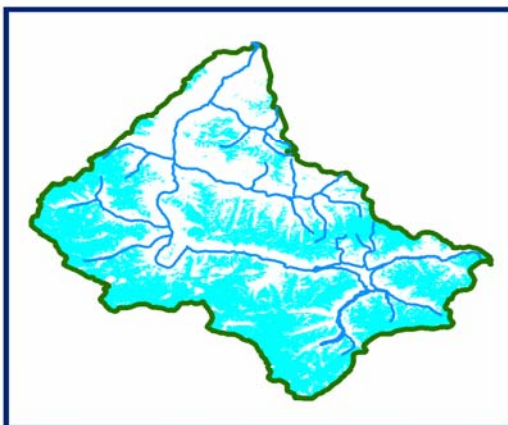
10 DAILY SNOW COVER MAP: SURU BASIN



DATA USED
01 NOVEMBER 2013



DATA USED
16 NOVEMBER 2013
20 NOVEMBER 2013



DATA USED
21 NOVEMBER 2013
26 NOVEMBER 2013
30 NOVEMBER 2013

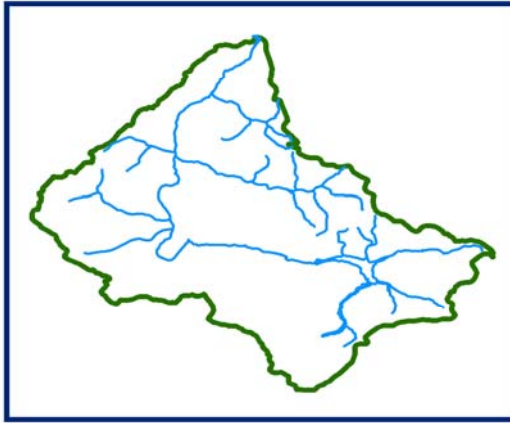


SNOW

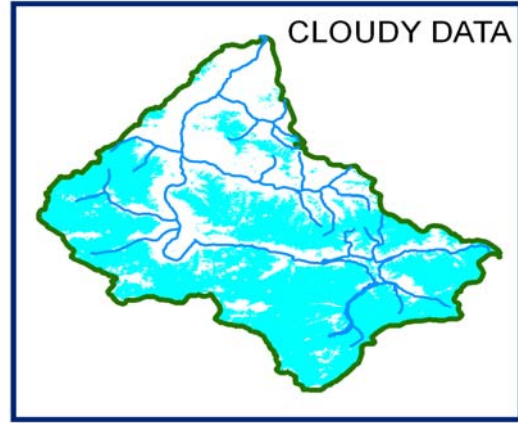


SNOW COVER MAP:

SURU BASIN



DATA NOT AVAILABLE



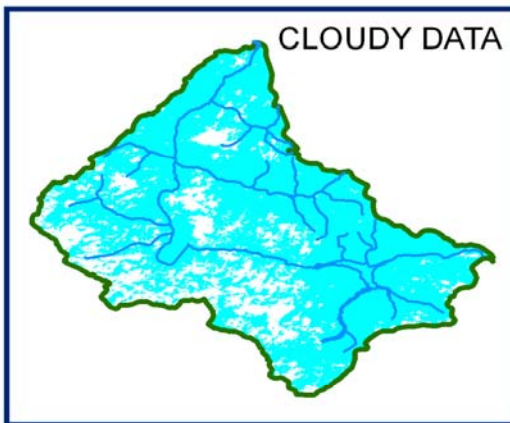
10 DECEMBER 2013



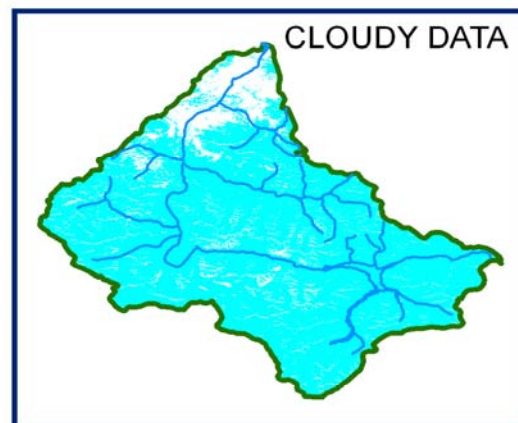
15 DECEMBER 2013



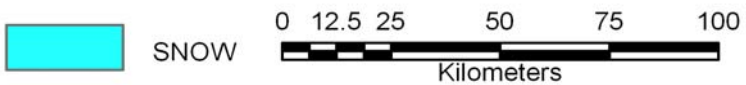
20 DECEMBER 2013



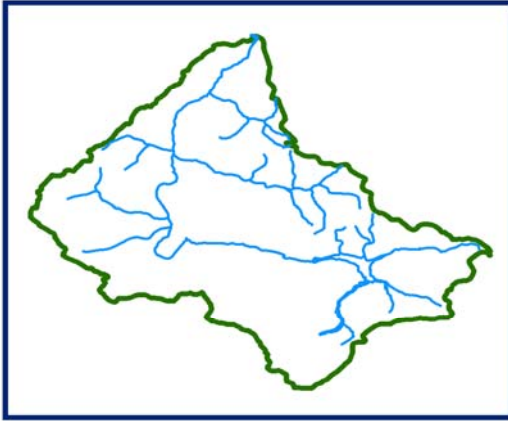
DATA NOT AVAILABLE



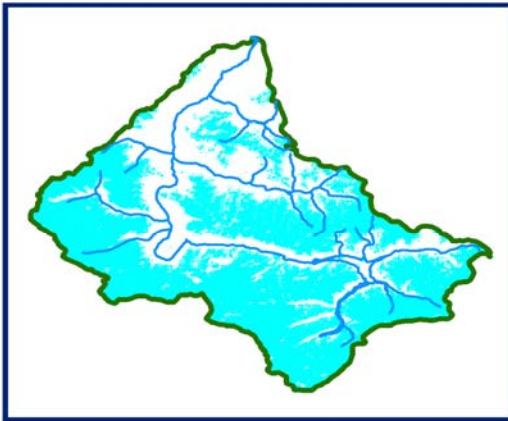
26 DECEMBER 2013



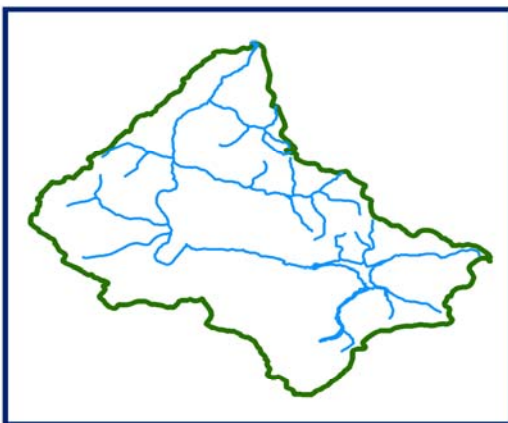
10 DAILY SNOW COVER MAP: SURU BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
15 DECEMBER 2013
20 DECEMBER 2013



DATA USED
DATA NOT AVAILABLE

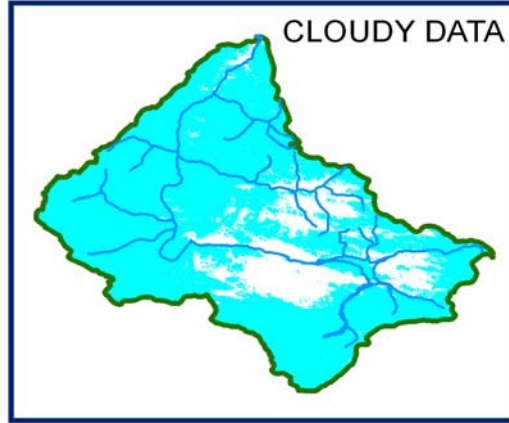


SNOW COVER MAP:

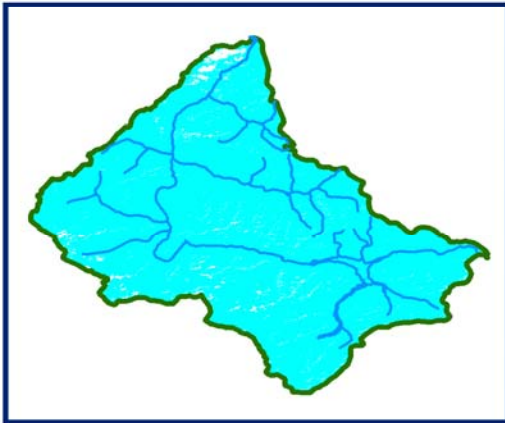
SURU BASIN



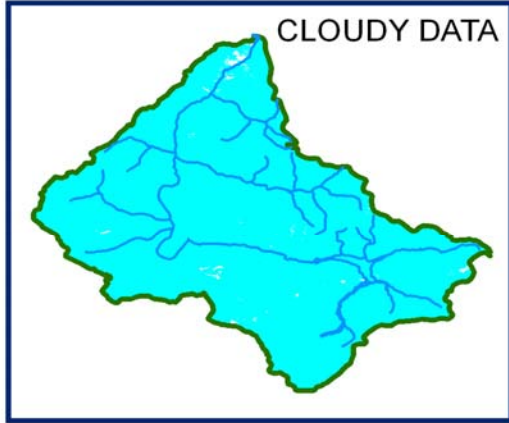
03 JANUARY 2014



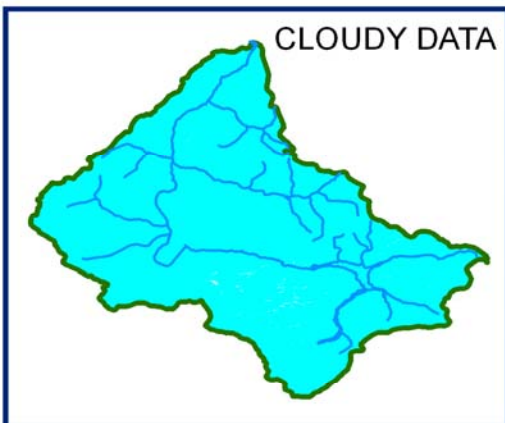
07 JANUARY 2014



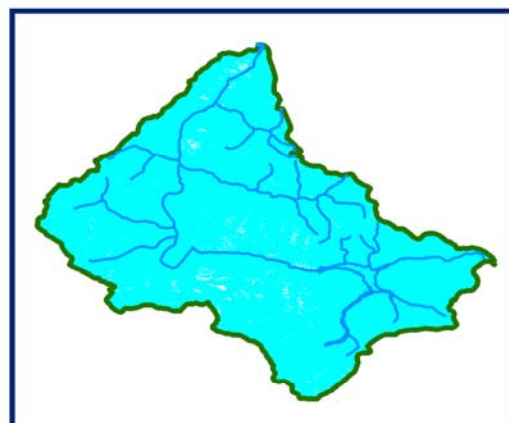
15 JANUARY 2014



17 JANUARY 2014



24 JANUARY 2014



31 JANUARY 2014



SNOW

0 12.5 25 50 75 100

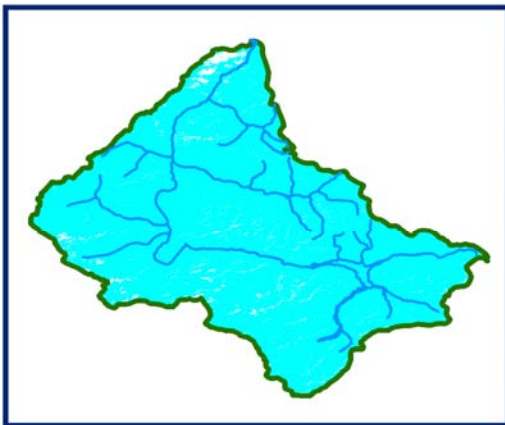


Kilometers

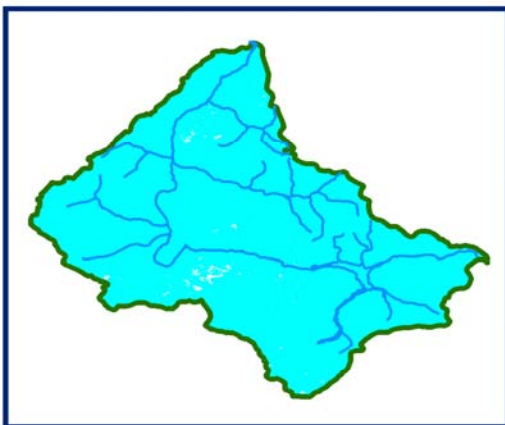
10 DAILY SNOW COVER MAP: SURU BASIN



**DATA USED
03 JANUARY 2014**



**DATA USED
15 JANUARY 2014**



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



SNOW

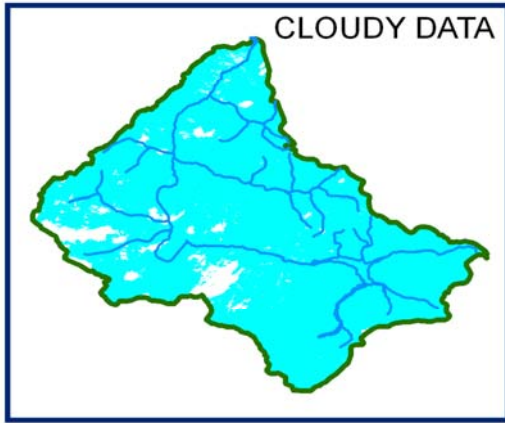
0 12.5 25 50 75 100



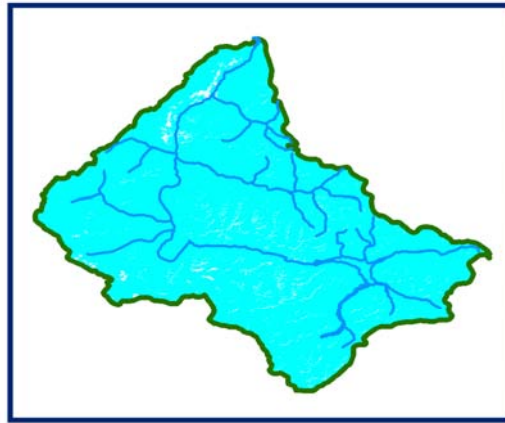
Kilometers

SNOW COVER MAP:

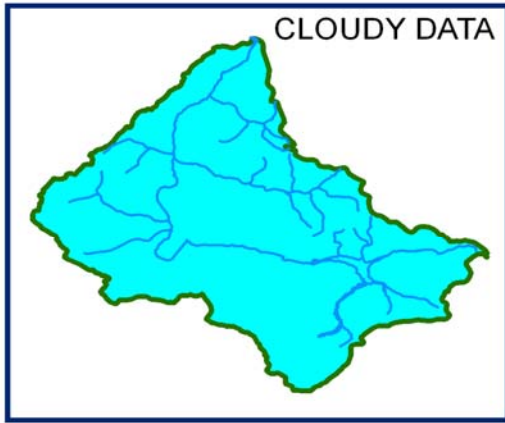
SURU BASIN



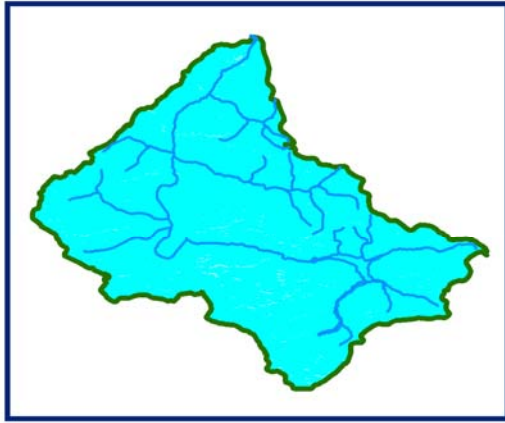
01 FEBRUARY 2014



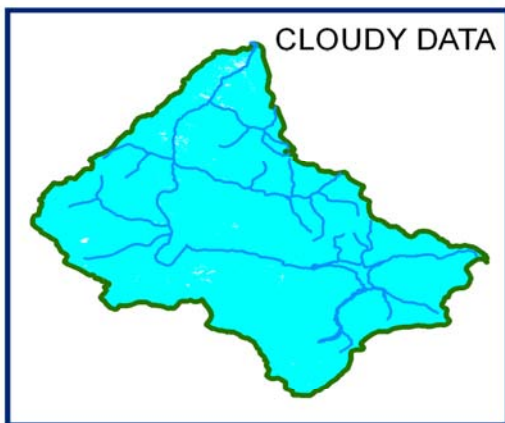
08 FEBRUARY 2014



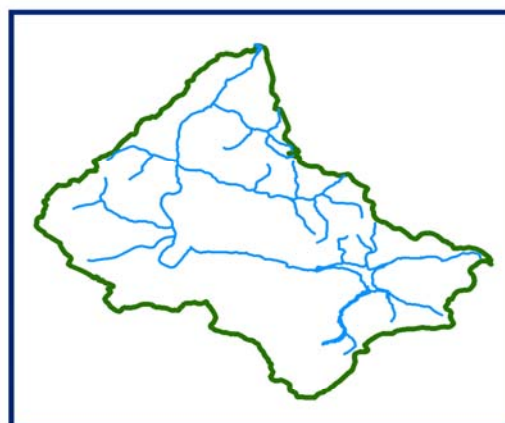
15 FEBRUARY 2014



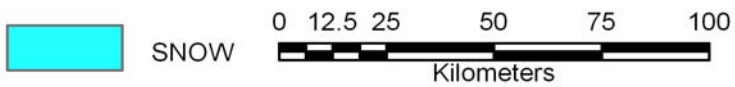
17 FEBRUARY 2014



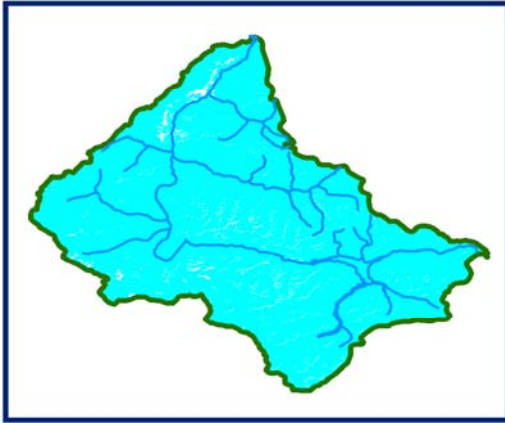
25 FEBRUARY 2014



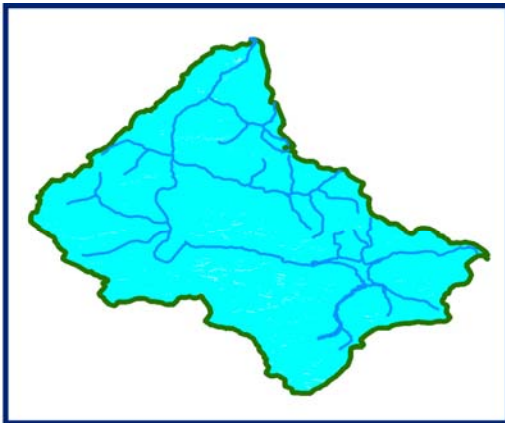
DATA NOT AVAILABLE



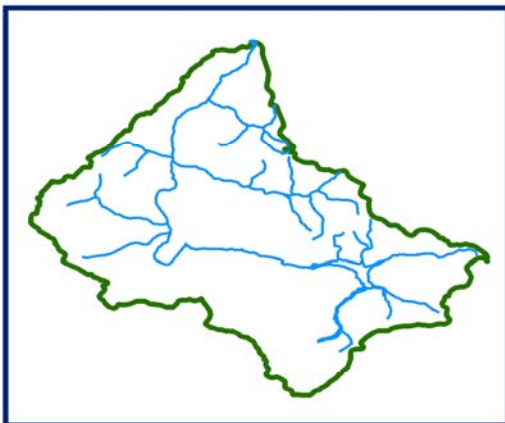
10 DAILY SNOW COVER MAP: SURU BASIN



DATA USED
08 FEBRUARY 2014



DATA USED
17 FEBRUARY 2014



DATA USED
DATA NOT AVAILABLE

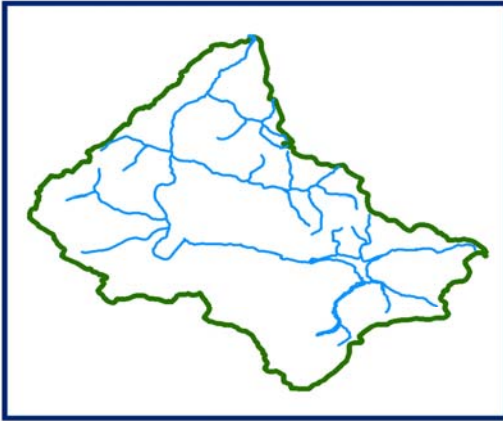


SNOW

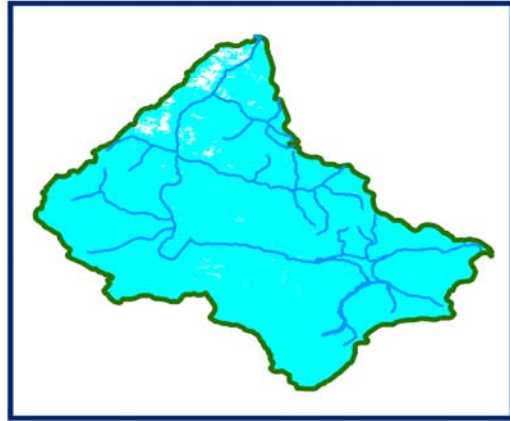


SNOW COVER MAP:

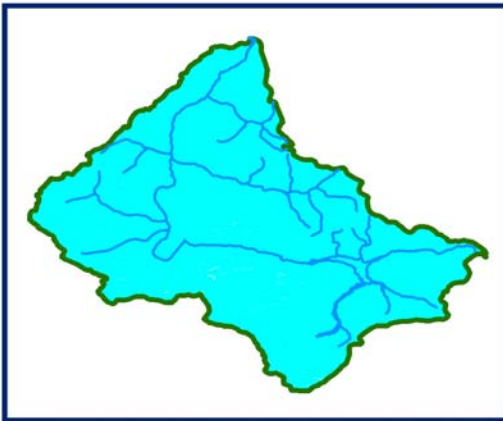
SURU BASIN



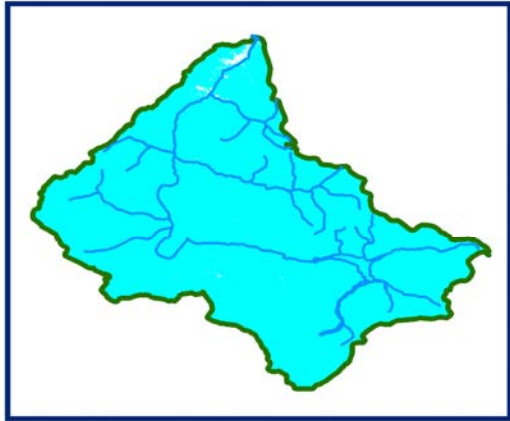
DATA NOT AVAILABLE



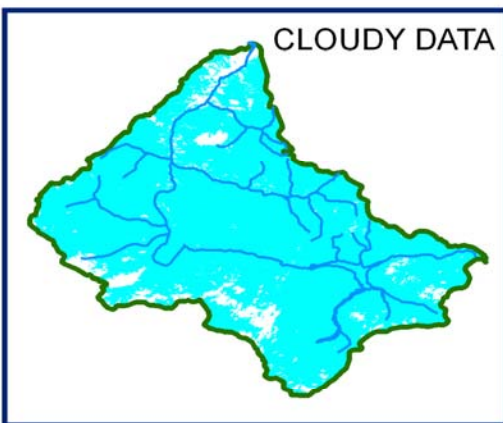
06 MARCH 2014



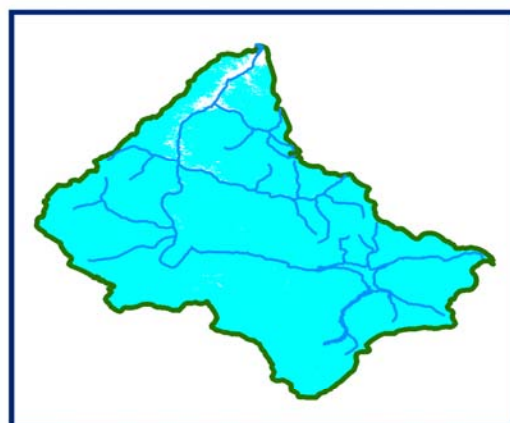
13 MARCH 2014



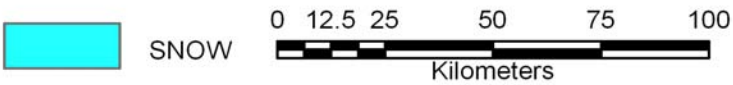
20 MARCH 2014



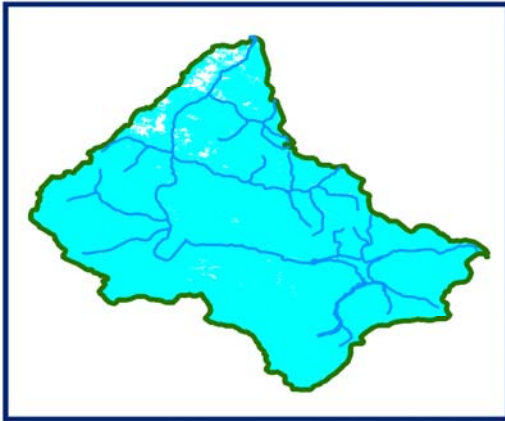
25 MARCH 2014



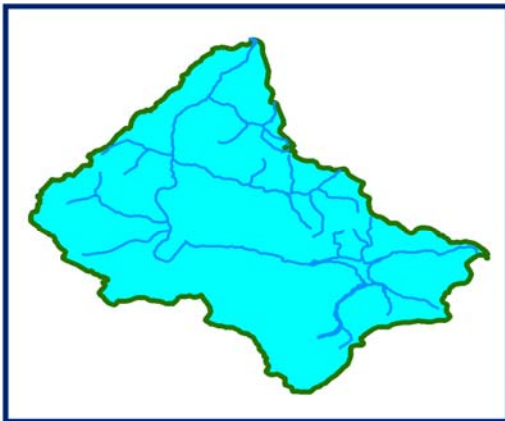
30 MARCH 2014



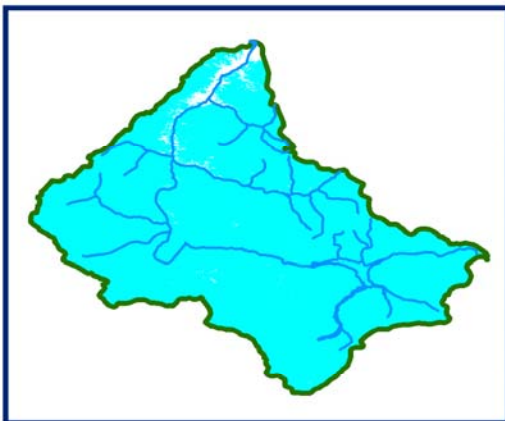
10 DAILY SNOW COVER MAP: SURU BASIN



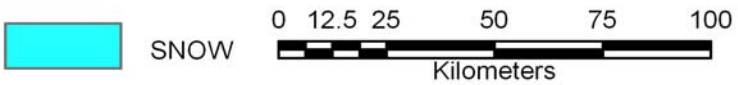
**DATA USED
06 MARCH 2014**



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

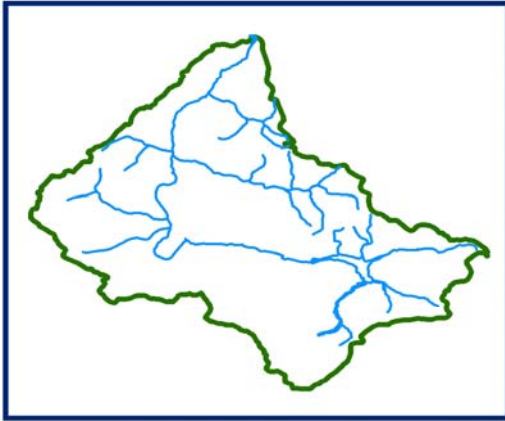


**DATA USED
30 MARCH 2014**

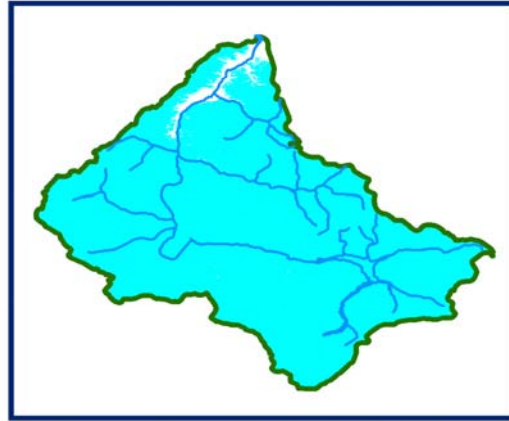


SNOW COVER MAP:

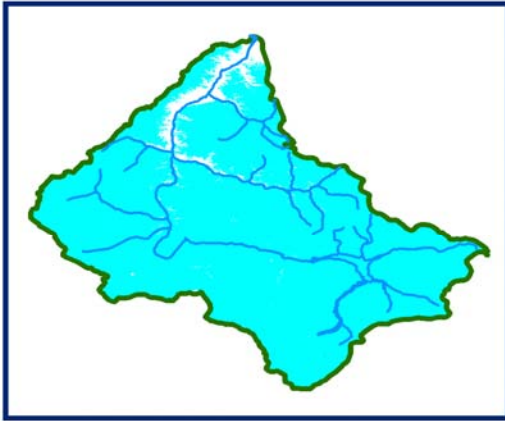
SURU BASIN



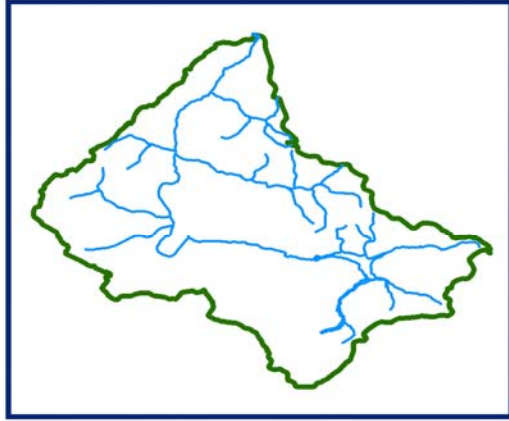
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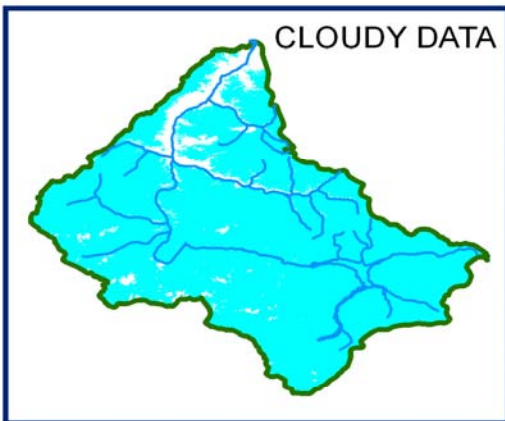
09 APRIL 2014



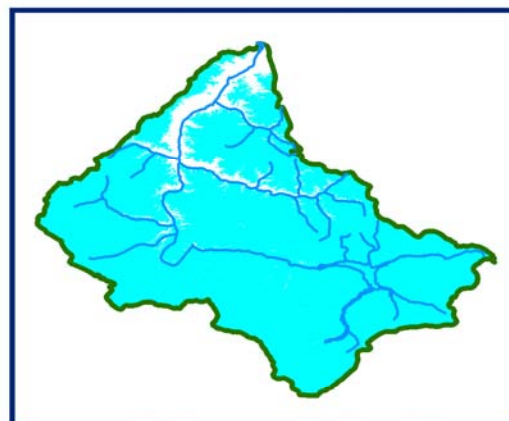
14 APRIL 2014



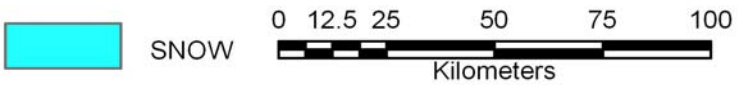
DATA NOT AVAILABLE



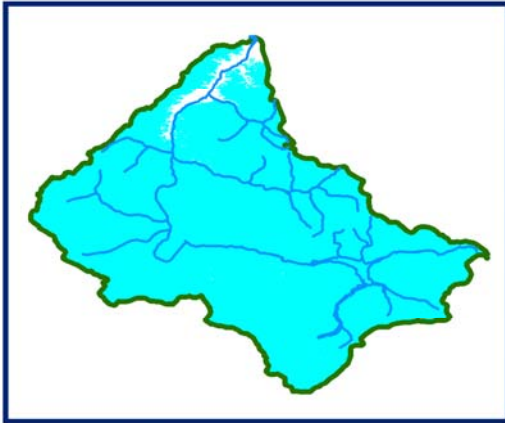
23 APRIL 2014



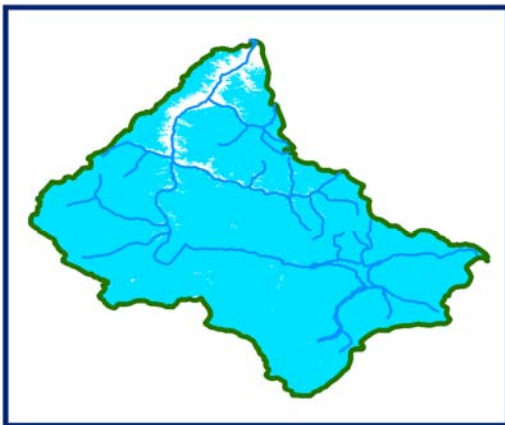
28 APRIL 2014



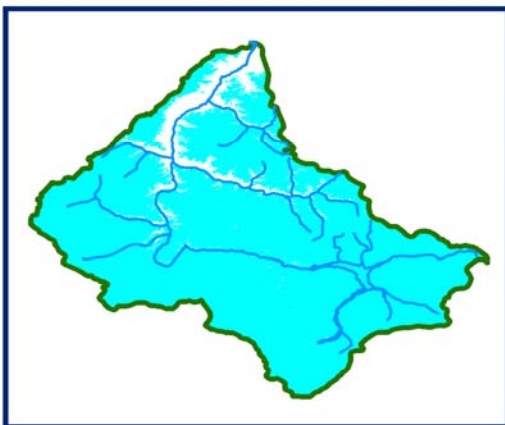
10 DAILY SNOW COVER MAP: SURU BASIN



**DATA USED
09 APRIL 2014**



**DATA USED
14 APRIL 2014**



**DATA USED
28 APRIL 2014**



SNOW

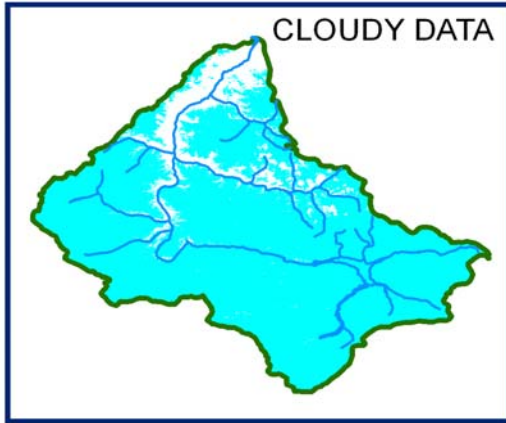
0 12.5 25 50 75 100



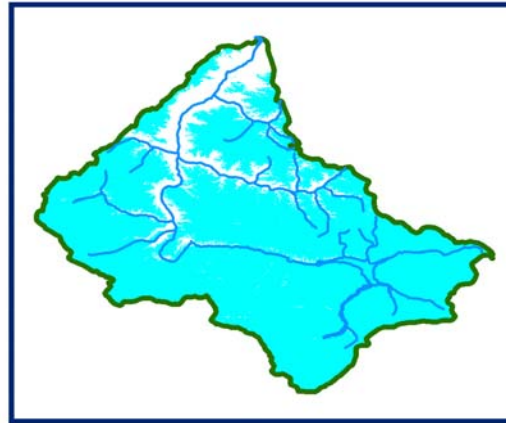
Kilometers

SNOW COVER MAP:

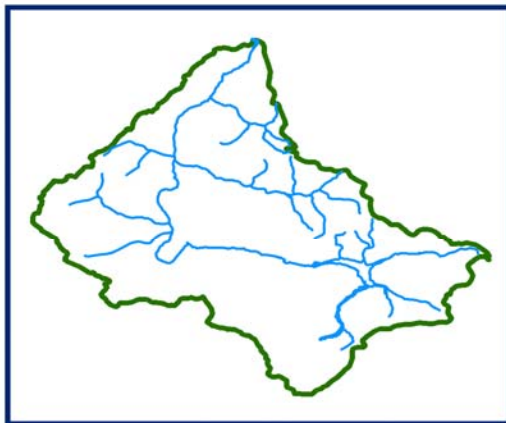
SURU BASIN



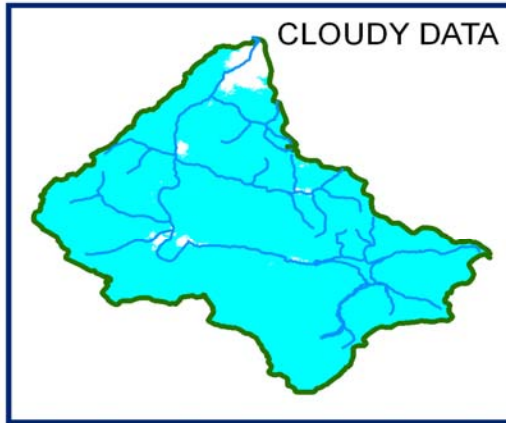
03 MAY 2014



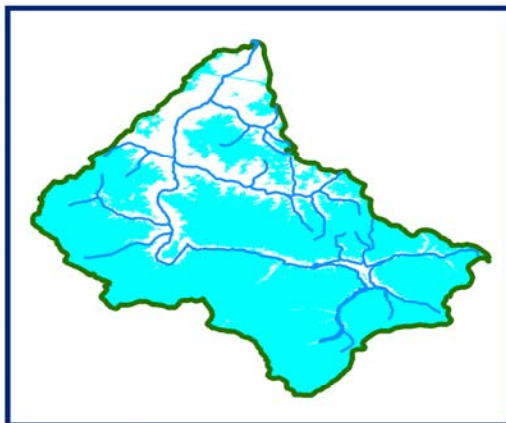
07 MAY 2014



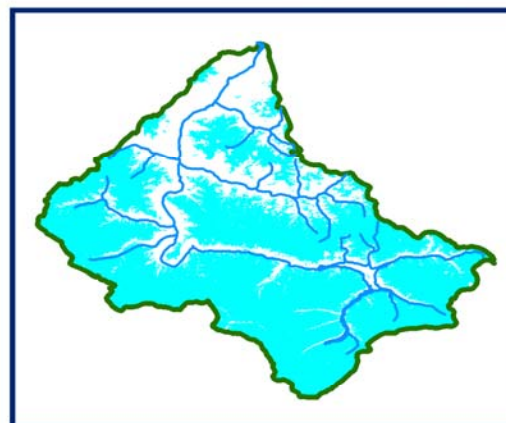
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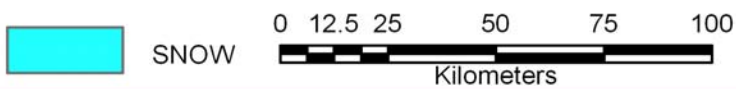
17 MAY 2014



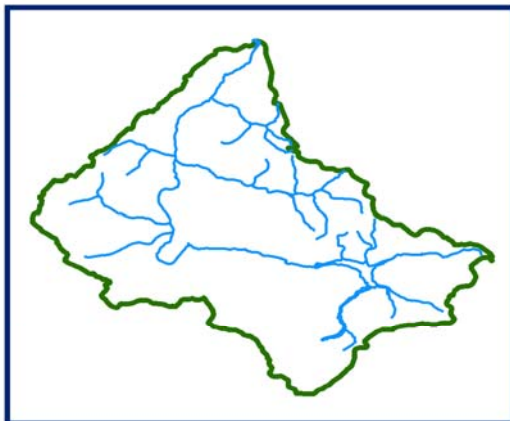
25 MAY 2014



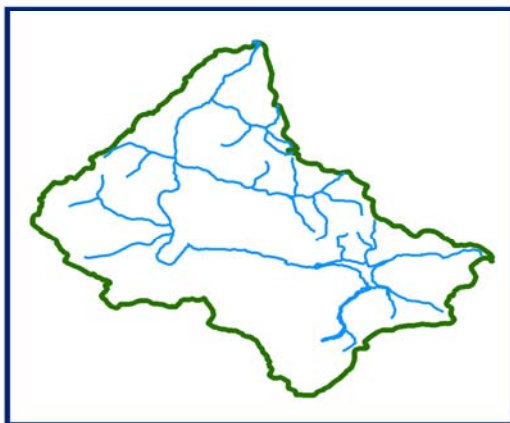
27 MAY 2014



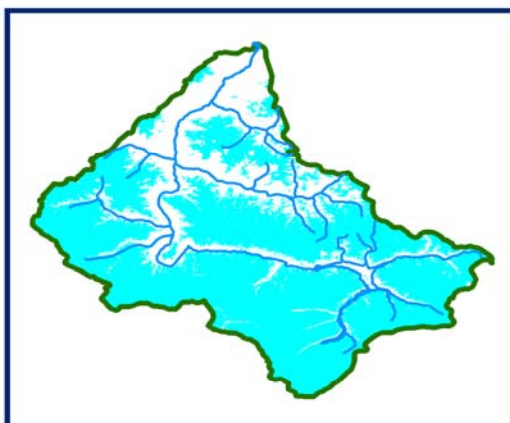
10 DAILY SNOW COVER MAP: SURU BASIN



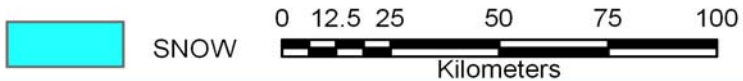
DATA USED
DATA NOT AVAILABLE



DATA USED
DATA NOT AVAILABLE



DATA USED
27 MAY 2014



SNOW COVER MAP:

SURU BASIN



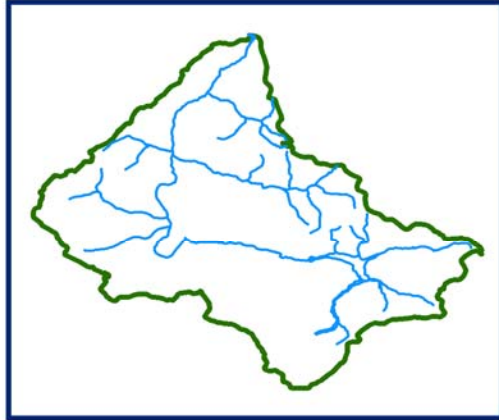
05 JUNE 2014



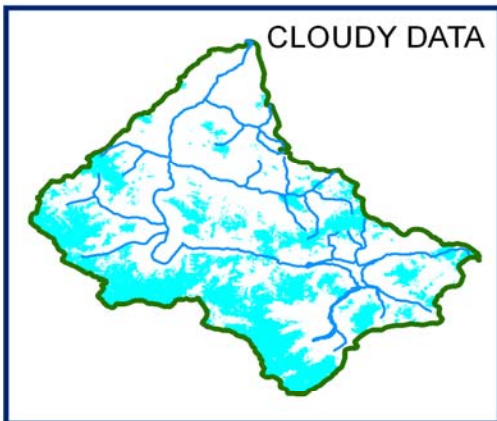
06 JUNE 2014



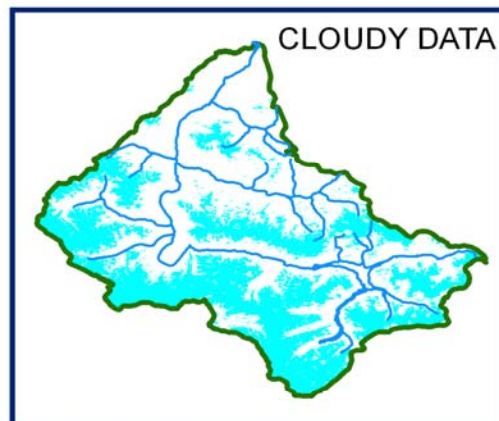
15 JUNE 2014



DATA NOT AVAILABLE



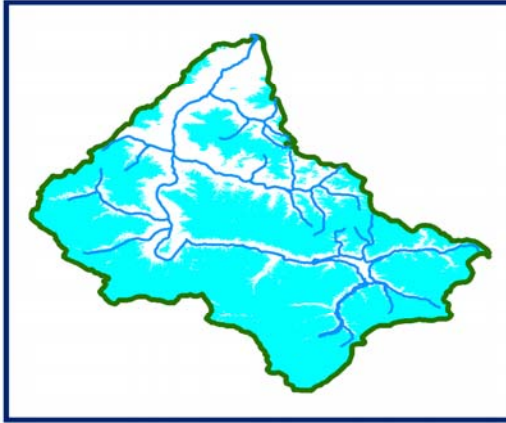
25 JUNE 2014



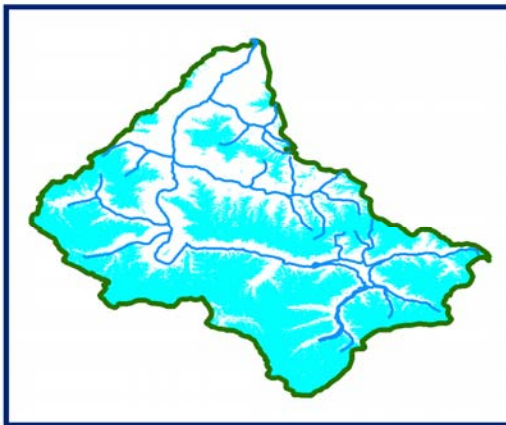
27 JUNE 2014



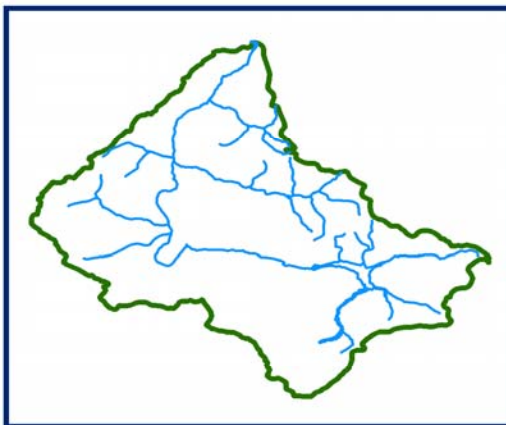
10 DAILY SNOW COVER MAP: SURU BASIN



DATA USED
05 JUNE 2014
06 JUNE 2014



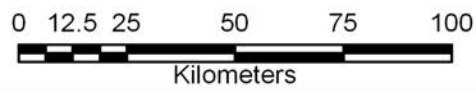
DATA USED
15 JUNE 2014



DATA USED
DATA NOT AVAILABLE



SNOW



ZASKAR BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: ZASKAR

BASIN AREA: 14914 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	11-Oct-13	970	7	5	21-Oct-13	1879	13
2	14-Oct-13	1933	13	6	23-Oct-13	1443	10
3	16-Oct-13	2535	17	7	25-Oct-13	1701	11
4	18-Oct-13	1642	11	8	28-Oct-13	1419	10
November 2013							
9	2-Nov-13	2631	18	12	21-Nov-13	3085	21
10	11-Nov-13	5202	35	13	26-Nov-13	2326	16
11	16-Nov-13	4200	28	14	30-Nov-13	1984	13
December 2013							
15	1-Dec-13	1880	13	18	20-Dec-13	2333	16
16	10-Dec-13	3433	23	19	24-Dec-13	7156	48
17	15-Dec-13	2428	16	20	25-Dec-13	4439	30
January 2014							
21	3-Jan-14	5064	34	24	27-Jan-14	12626	85
22	17-Jan-14	10698	72	25	29-Jan-14	13095	88
23	20-Jan-14	13268	89	26	30-Jan-14	12778	86
February 2014							
27	1-Feb-14	11384	76	31	15-Feb-14	14561	98
28	6-Feb-14	12386	83	32	20-Feb-14	13808	93
29	8-Feb-14	14133	95	33	25-Feb-14	13595	91
30	10-Feb-14	11790	79				
March 2014							
34	6-Mar-14	13283	89	37	21-Mar-14	13135	88
35	7-Mar-14	13072	88	38	30-Mar-14	12831	86
36	16-Mar-14	12323	83	39	31-Mar-14	12570	84
April 2014							
40	9-Apr-14	11957	80	44	24-Apr-14	10180	68
41	12-Apr-14	12079	81	45	26-Apr-14	10843	73
42	14-Apr-14	11541	77	46	28-Apr-14	10350	69
43	23-Apr-14	10889	73				
May 2014							
47	3-May-14	10549	71	50	18-May-14	3633	24
48	8-May-14	7595	51	51	22-May-14	6941	47
49	17-May-14	8775	59	52	25-May-14	8218	55

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
53	27-May-14	6957	47				
June 2014							
54	1-Jun-14	11872	80	57	11-Jun-14	4848	33
55	6-Jun-14	6094	41	58	15-Jun-14	5866	39
56	10-Jun-14	5717	38	59	25-Jun-14	2922	20

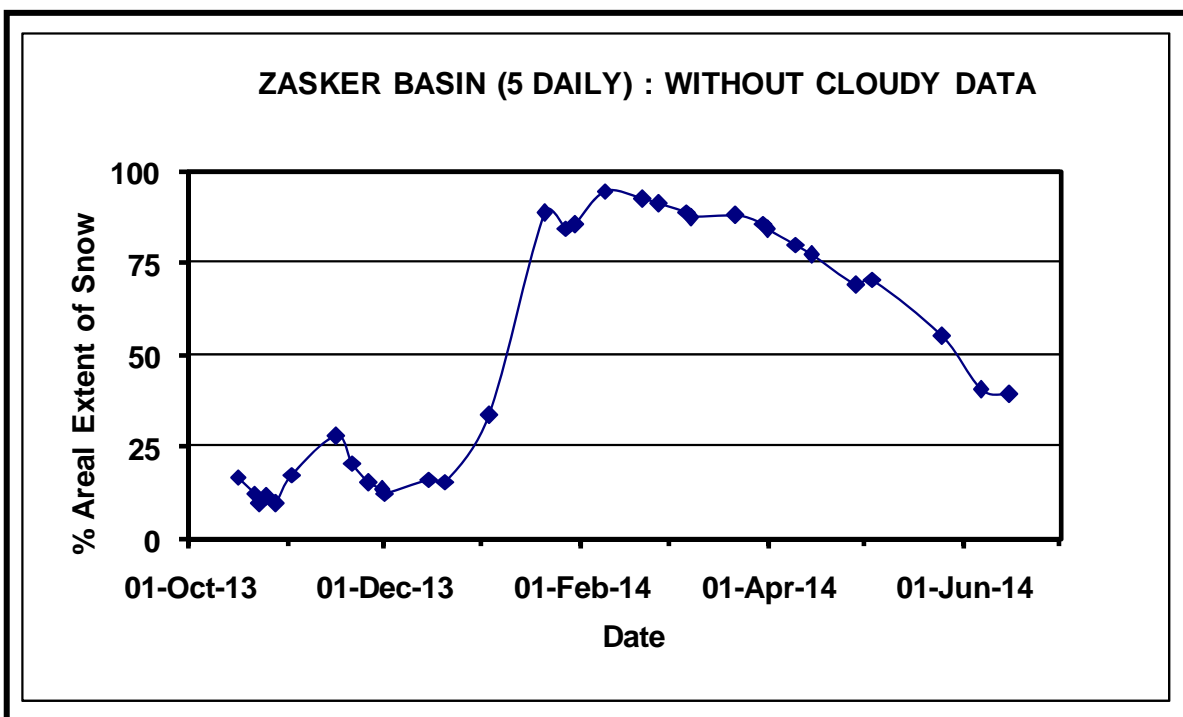
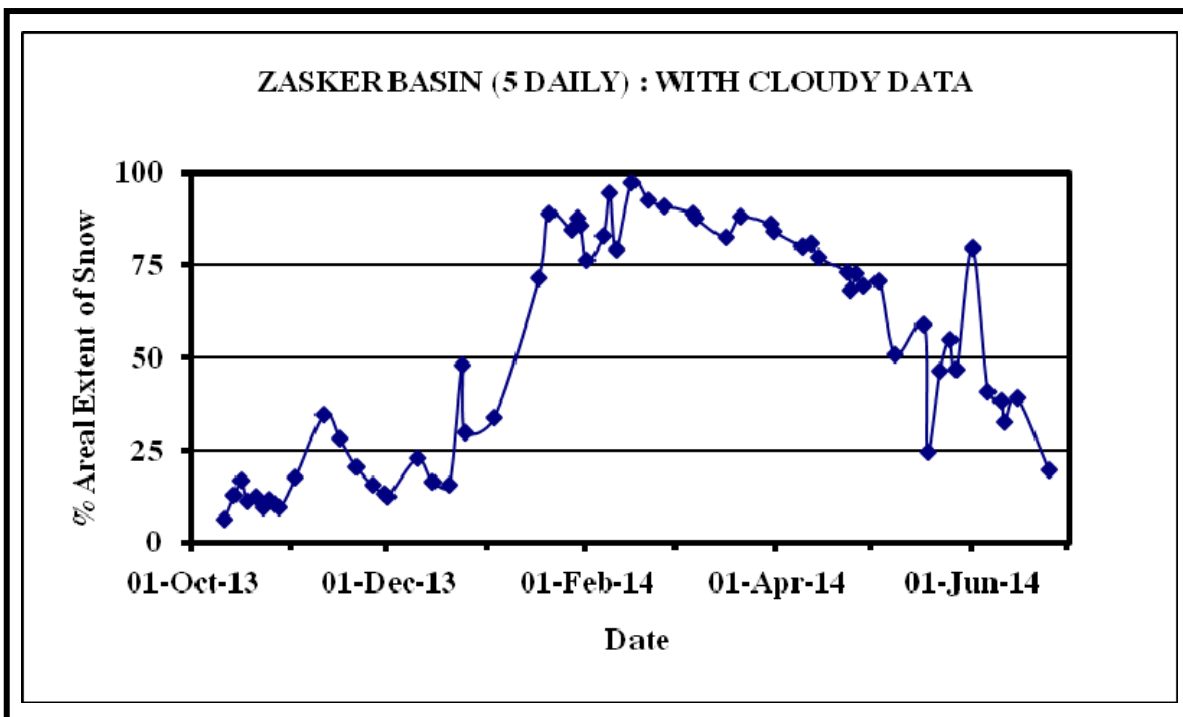
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: ZASKER

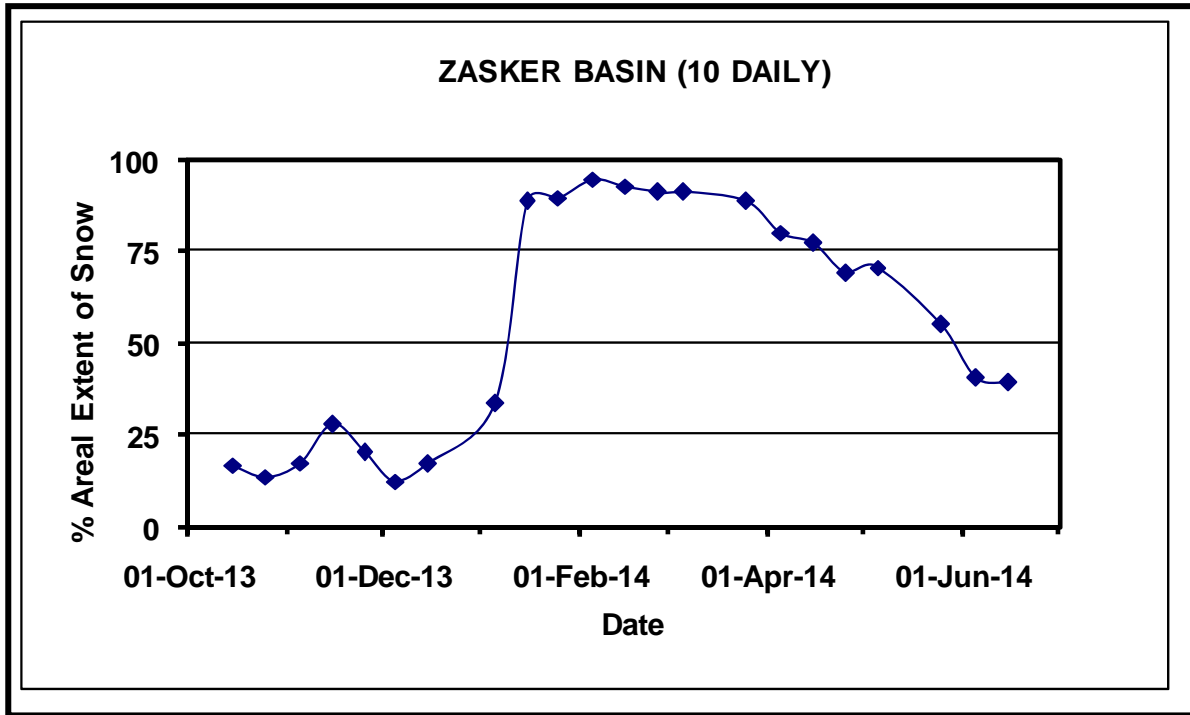
BASIN AREA: 14914 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2013							
1	15-Oct-13	2535	17	2	25-Oct-13	2062	14
November 2013							
3	5-Nov-13	2631	18	5	25-Nov-13	3027	20
4	15-Nov-13	4200	28				
December 2013							
6	5-Dec-13	1880	13	7	15-Dec-13	2557	17
January 2014							
8	5-Jan-14	5064	34	10	25-Jan-14	13389	90
9	15-Jan-14	13268	89				
February 2014							
11	5-Feb-14	14133	95	13	25-Feb-14	13595	91
12	15-Feb-14	13870	93				
March 2014							
14	5-Mar-14	13620	91	15	25-Mar-14	13235	89
April 2014							
16	5-Apr-14	11957	80	18	25-Apr-14	10350	69
17	15-Apr-14	11541	77				
May 2014							
19	5-May-14	10549	71	20	25-May-14	8218	55
June 2014							
21	5-Jun-14	6094	41	22	15-Jun-14	5866	39

Snow cover depletion curve



Snow cover depletion curve



SNOW COVER MAP

SNOW COVER MAP:

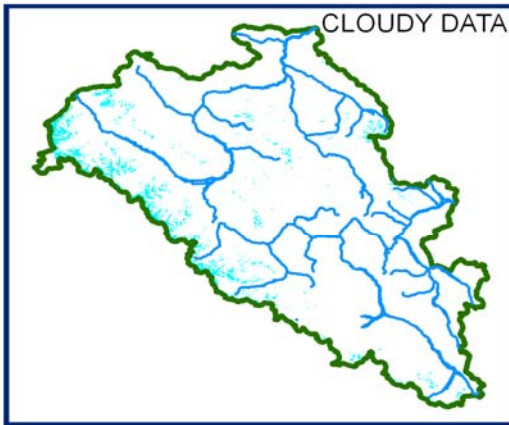
ZASKER BASIN



DATA NOT AVAILABLE



DATA NOT AVAILABLE



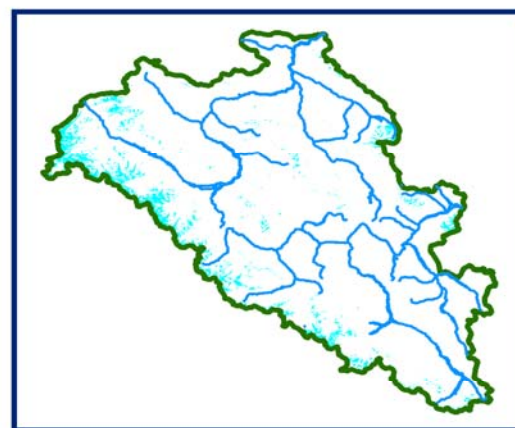
11 OCTOBER 2013



16 OCTOBER 2013



23 OCTOBER 2013



28 OCTOBER 2013



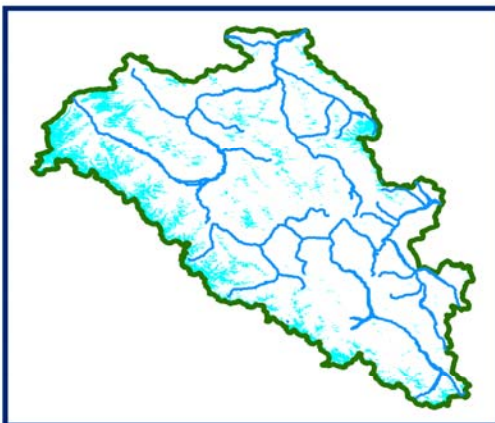
10 DAILY SNOW COVER MAP: ZASKER BASIN



DATA USED
DATA NOT AVAILABLE



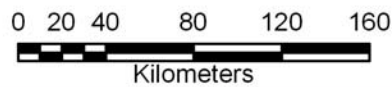
DATA USED
16 OCTOBER 2013



DATA USED
21 OCTOBER 2013
25 OCTOBER 2013
28 OCTOBER 2013



SNOW



SNOW COVER MAP:

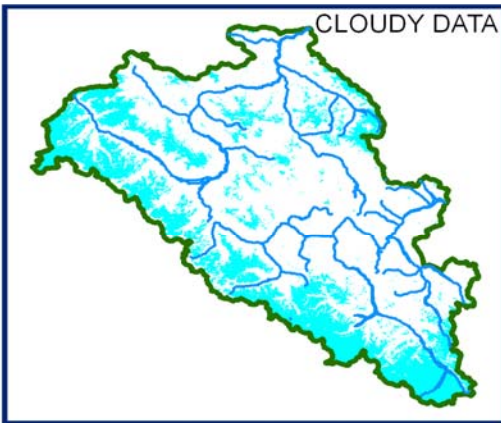
ZASKER BASIN



02 NOVEMBER 2013



DATA NOT AVAILABLE



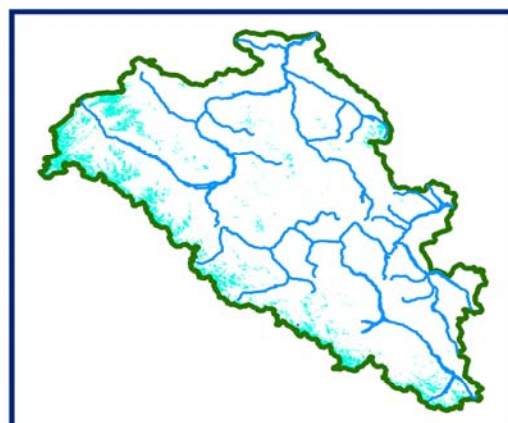
11 NOVEMBER 2013



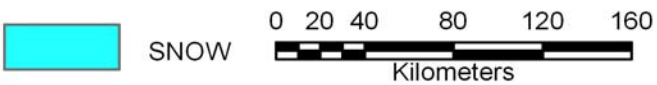
16 NOVEMBER 2013



21 NOVEMBER 2013



30 NOVEMBER 2013



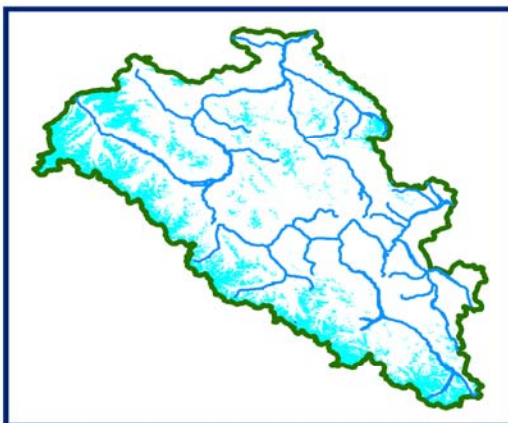
10 DAILY SNOW COVER MAP: ZASKER BASIN



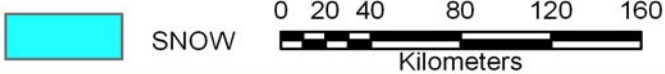
**DATA USED
02 NOVEMBER 2013**



**DATA USED
16 NOVEMBER 2013**

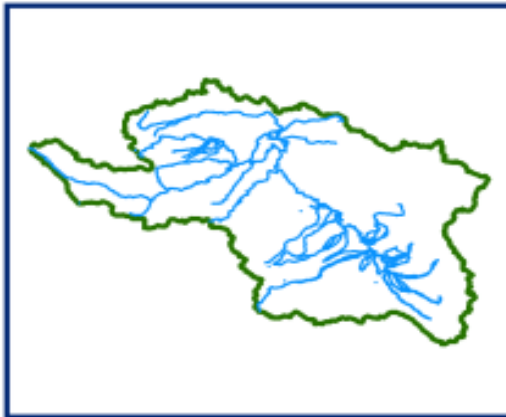


**DATA USED
21 NOVEMBER 2013
26 NOVEMBER 2013
30 NOVEMBER 2013**

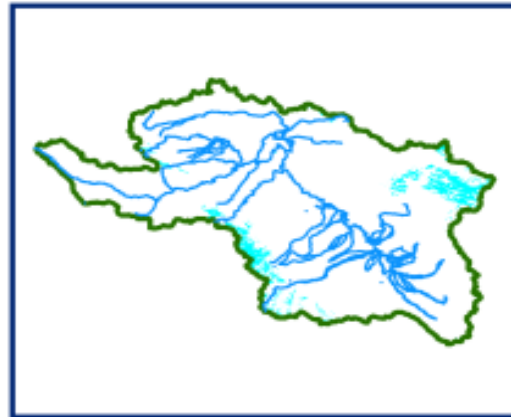


SNOW COVER MAP:

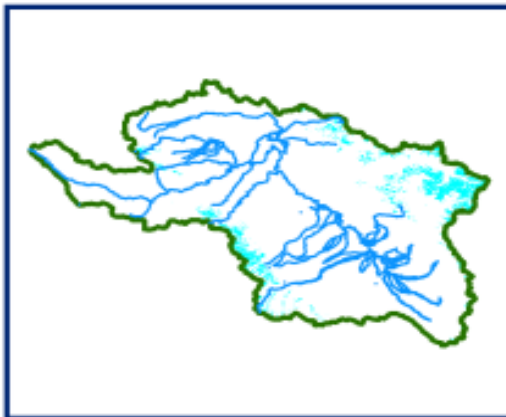
JHELUM BASIN



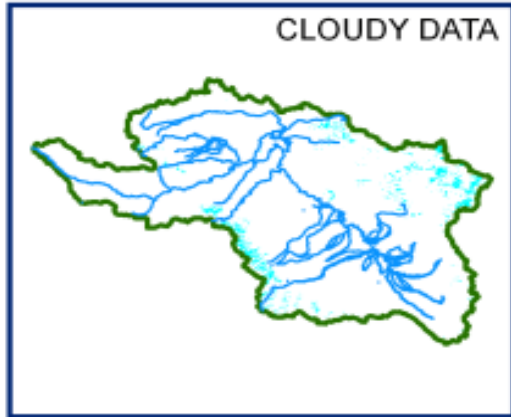
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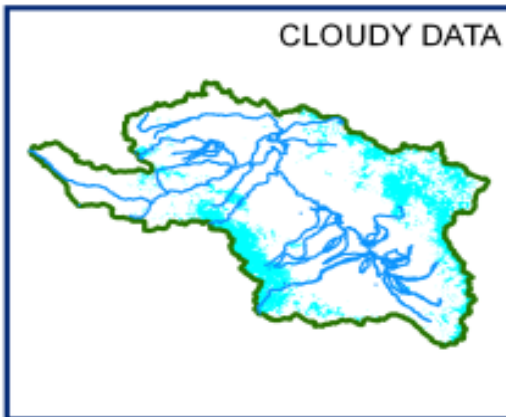
10 DECEMBER 2013



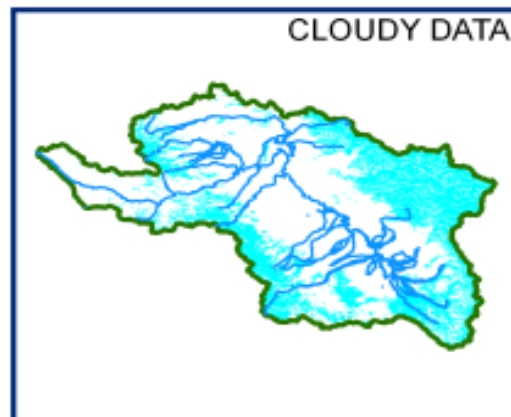
15 DECEMBER 2013



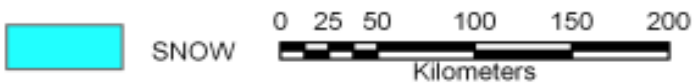
17 DECEMBER 2013



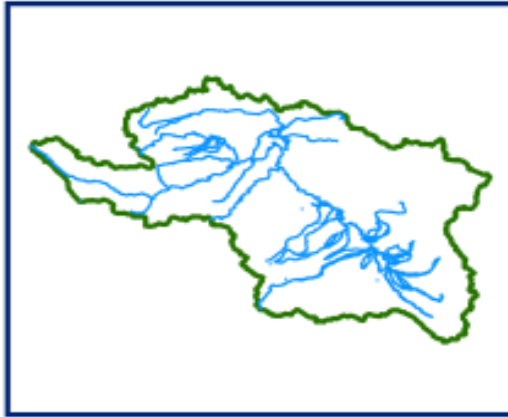
24 DECEMBER 2013



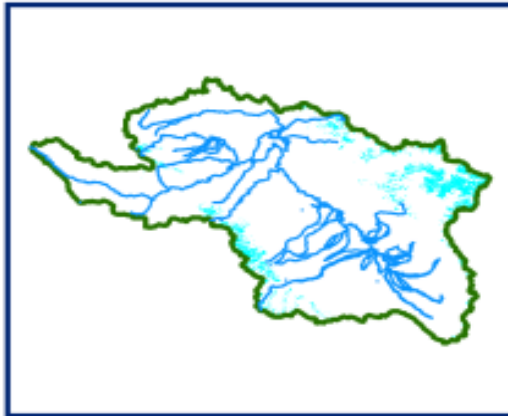
26 DECEMBER 2013



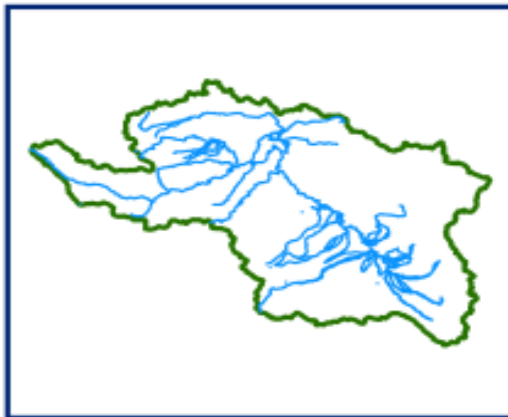
10 DAILY SNOW COVER MAP: JHELUM BASIN



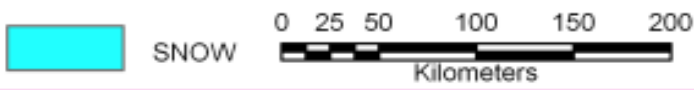
DATA USED
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DATA USED
15 DECEMBER 2013

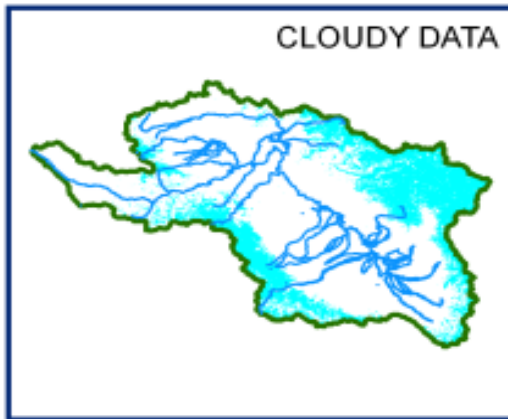


DATA USED
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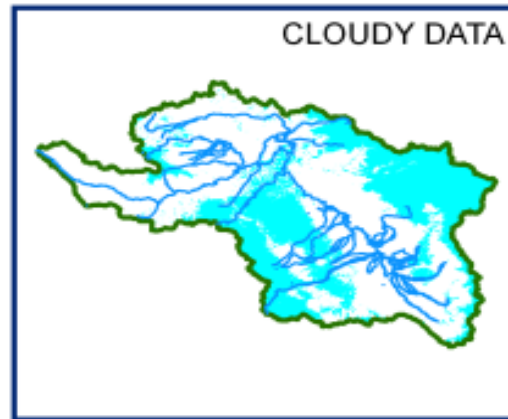


SNOW COVER MAP:

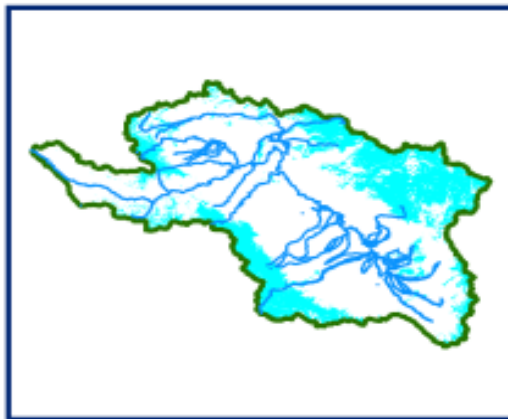
JHELUM BASIN



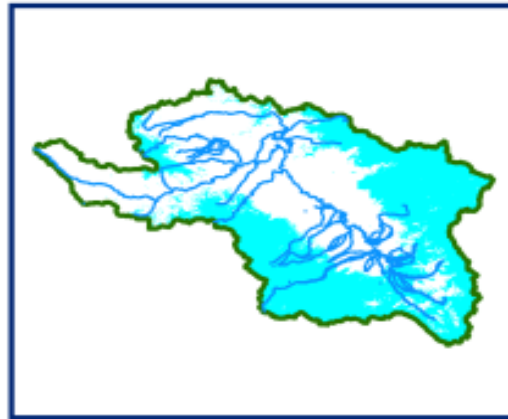
03 JANUARY 2014



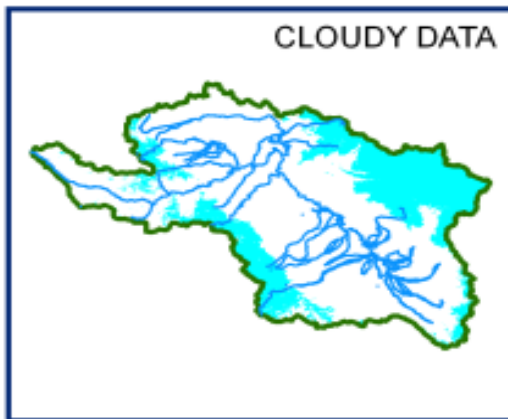
07 JANUARY 2014



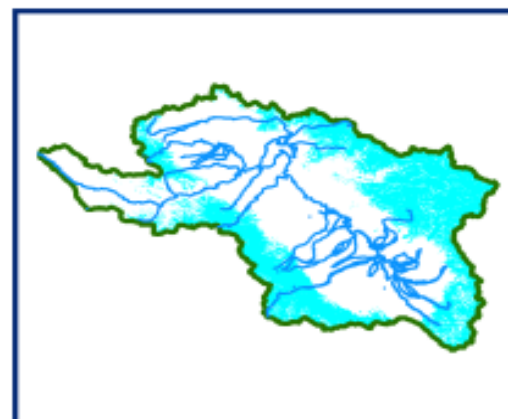
15 JANUARY 2014



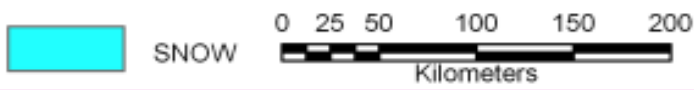
20 JANUARY 2014



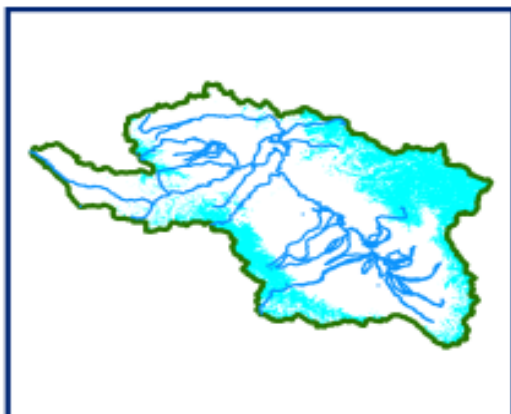
24 JANUARY 2014



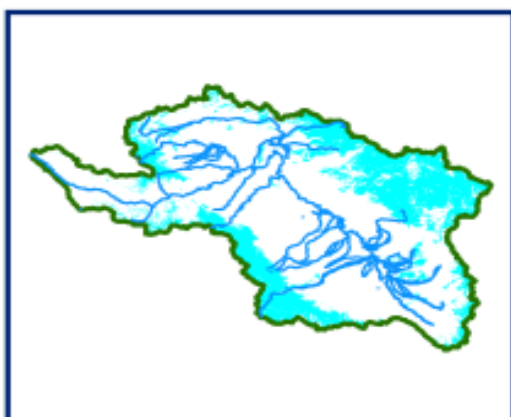
29 JANUARY 2014



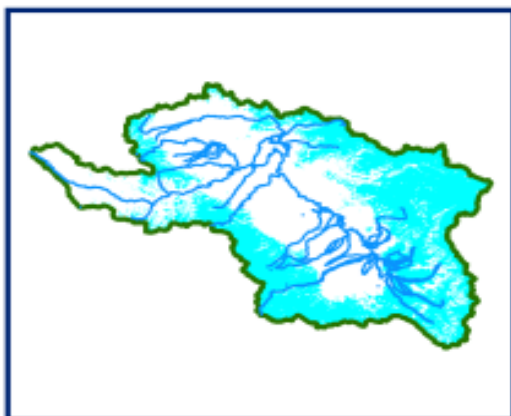
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
03 JANUARY 2014



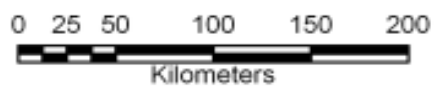
DATA USED
15 JANUARY 2014



DATA USED
29 JANUARY 2014
31 JANUARY 2014

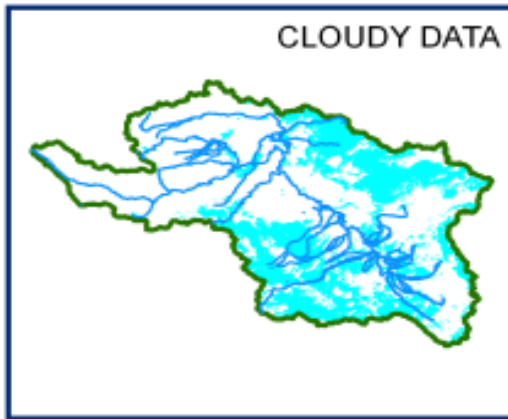


SNOW

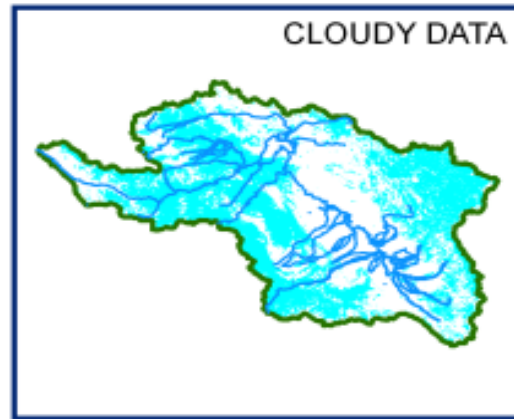


SNOW COVER MAP:

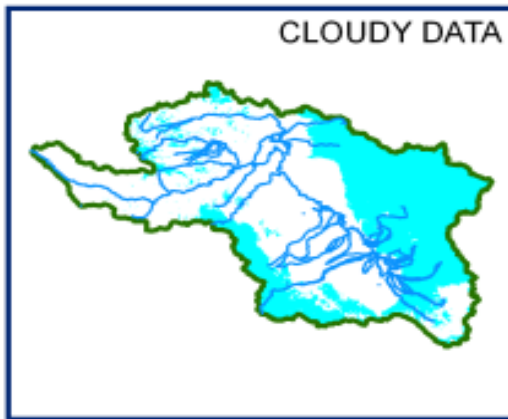
JHELUM BASIN



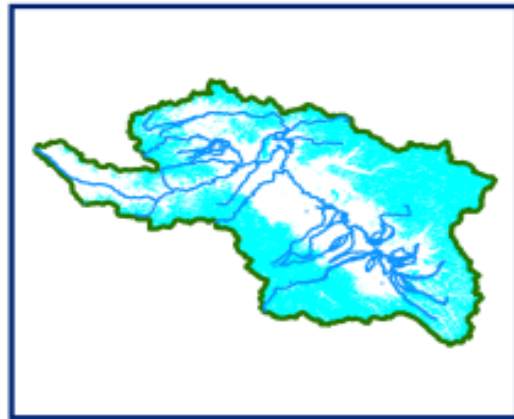
01 FEBRUARY 2014



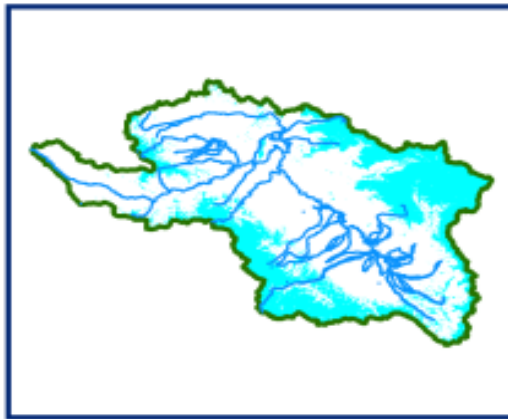
08 FEBRUARY 2014



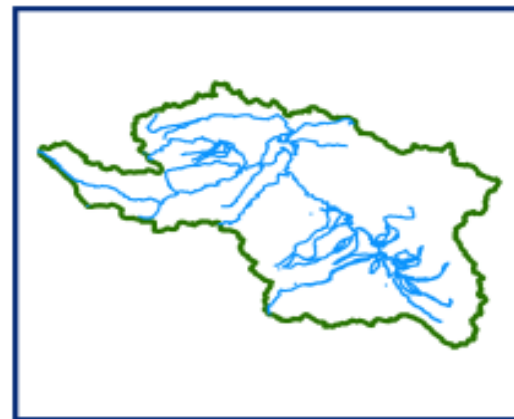
15 FEBRUARY 2014



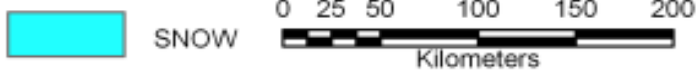
17 FEBRUARY 2014



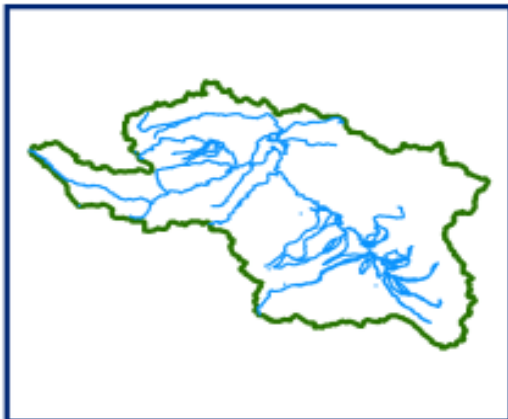
25 FEBRUARY 2014



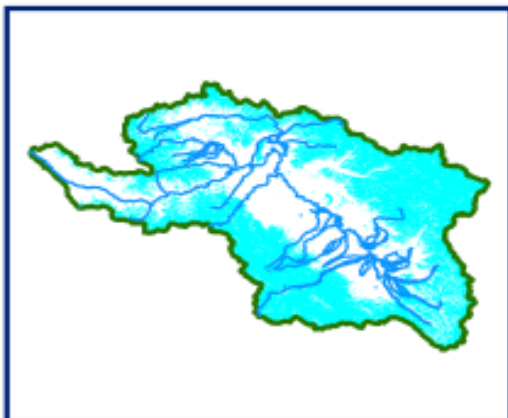
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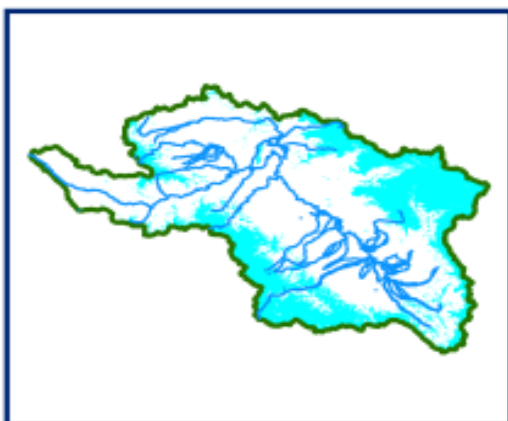
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
DATA NOT AVAILABLE



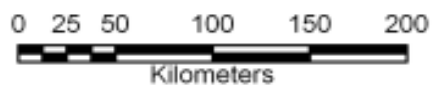
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17 FEBRUARY 2014



DATA USED
25 FEBRUARY 2014

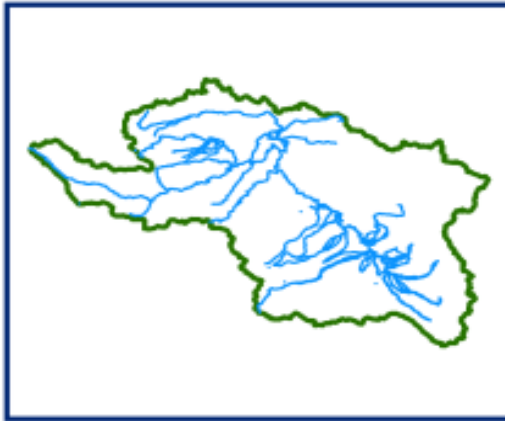


SNOW

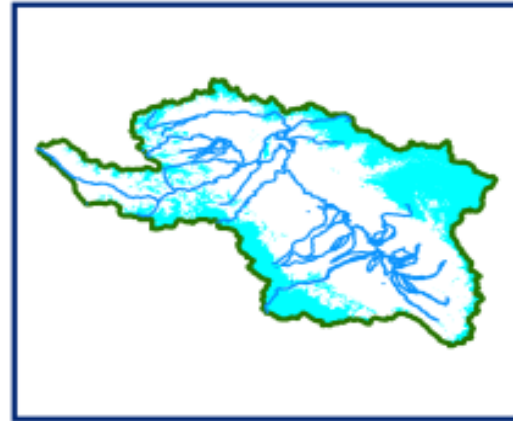


SNOW COVER MAP:

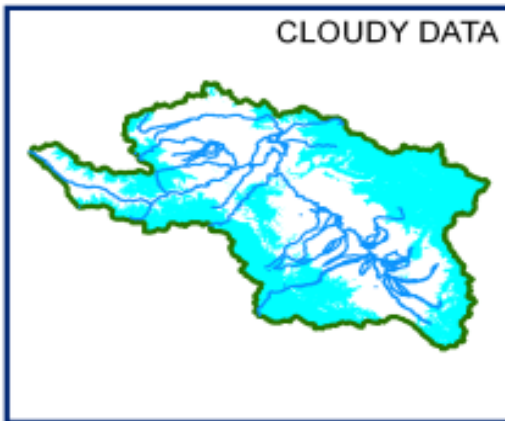
JHELUM BASIN



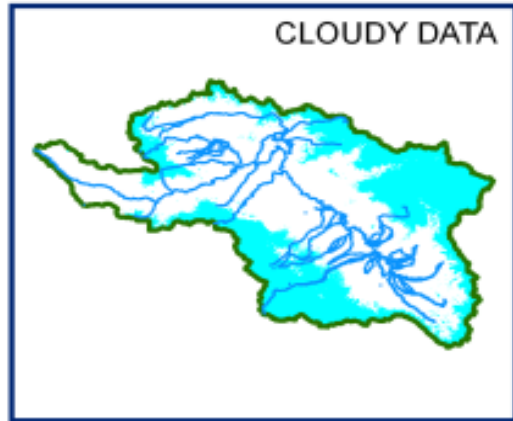
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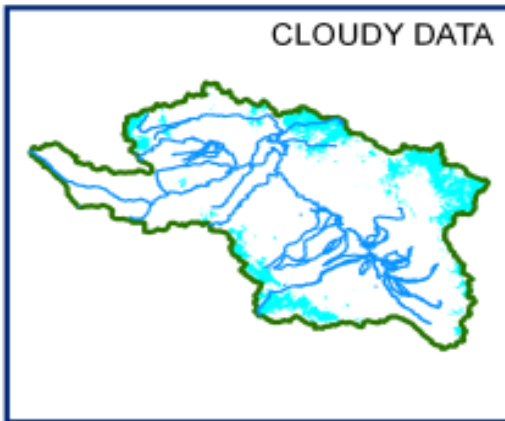
06 MARCH 2014



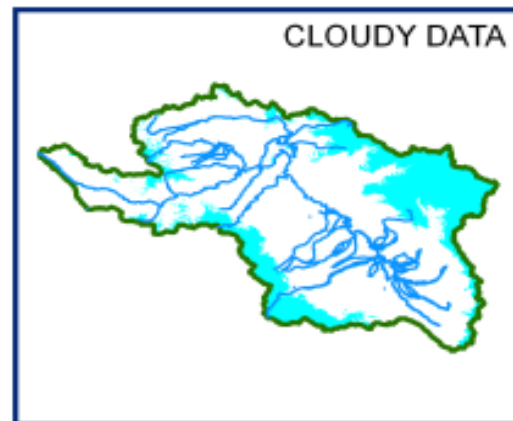
13 MARCH 2014



20 MARCH 2014



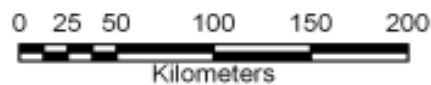
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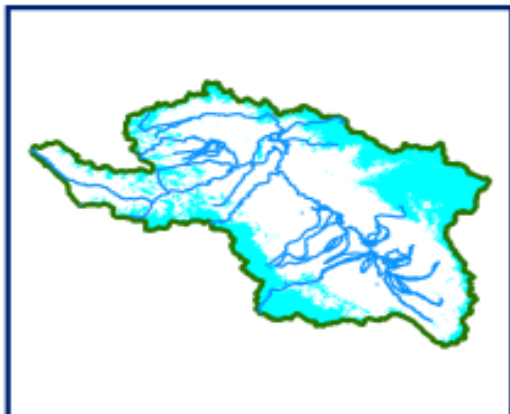
30 MARCH 2014



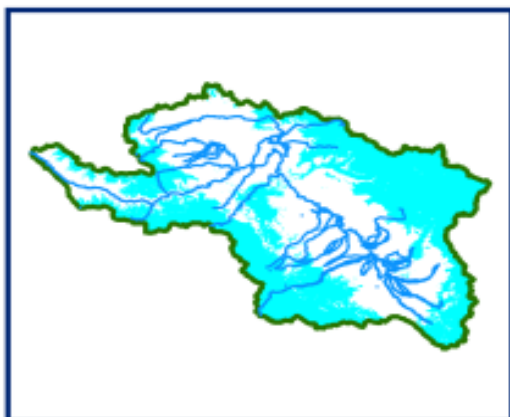
SNOW



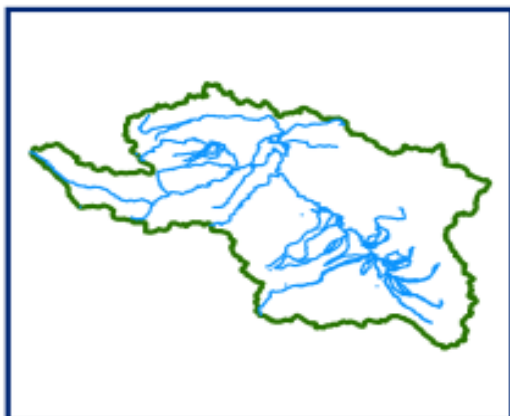
10 DAILY SNOW COVER MAP: JHELUM BASIN



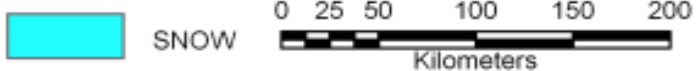
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06 MARCH 2014



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13 MARCH 2014

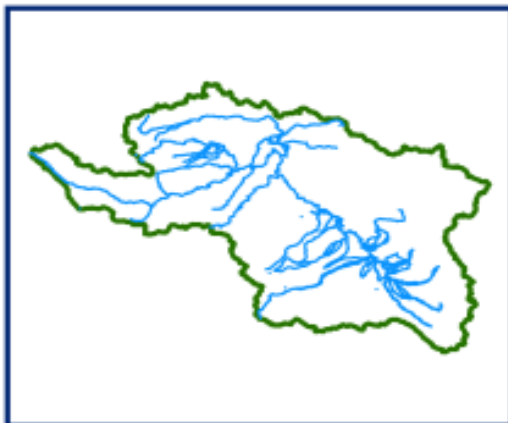


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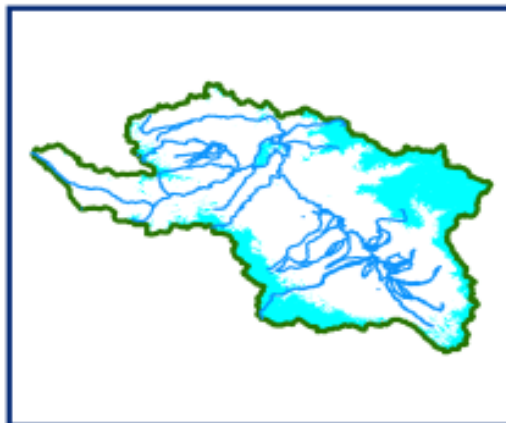


SNOW COVER MAP:

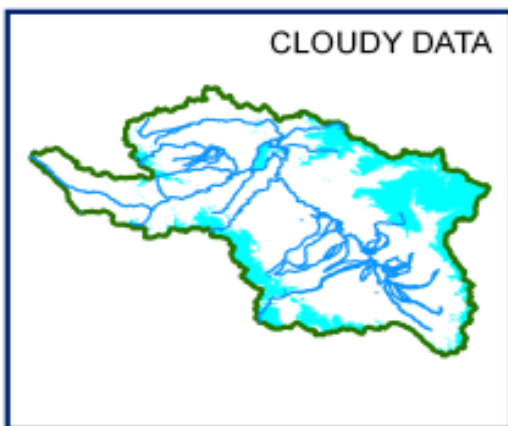
JHELUM BASIN



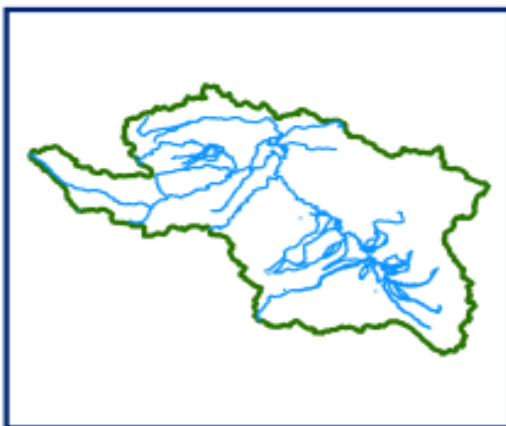
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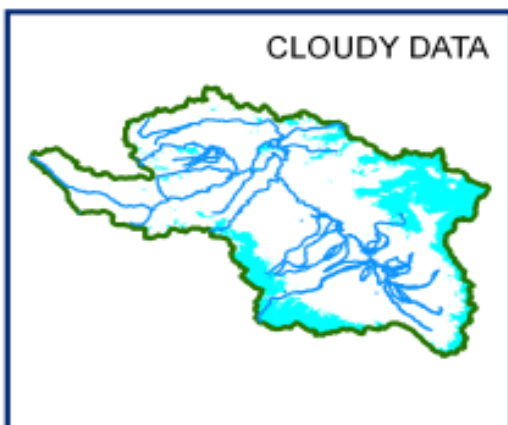
09 APRIL 2014



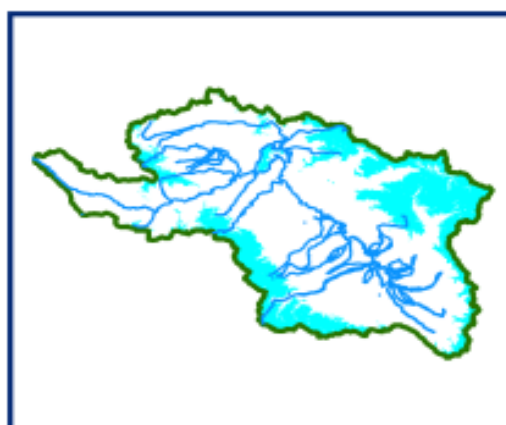
14 APRIL 2014



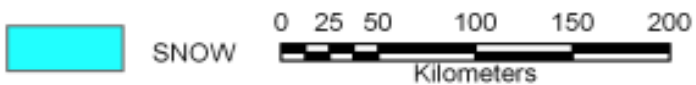
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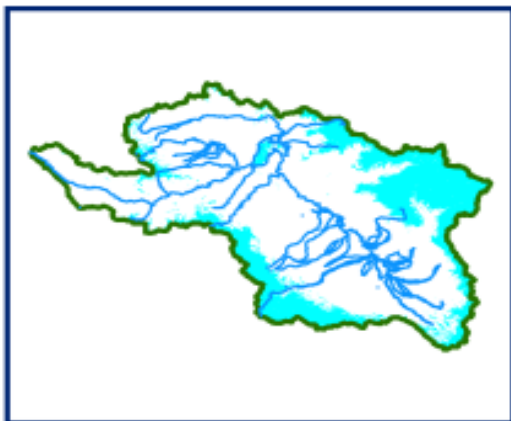
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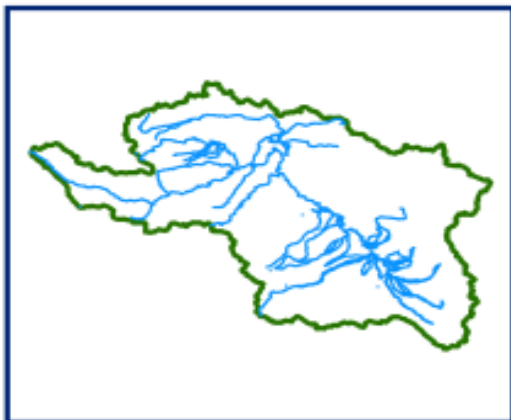
28 APRIL 2014



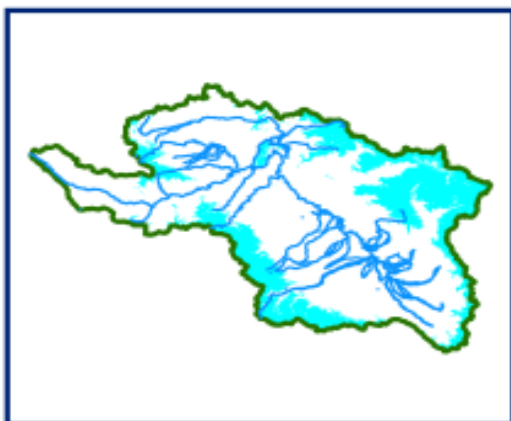
10 DAILY SNOW COVER MAP: JHELUM BASIN



**DATA USED
09 APRIL 2014**



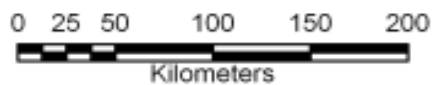
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**DATA USED
28 APRIL 2014**

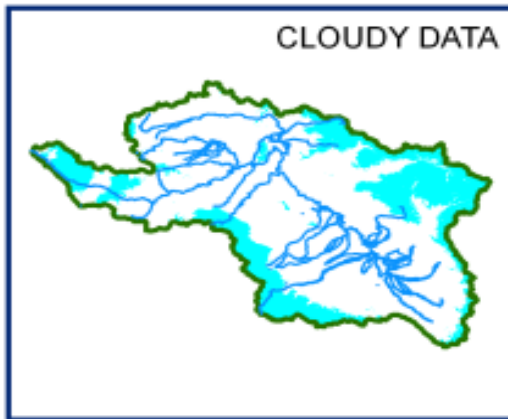


SNOW

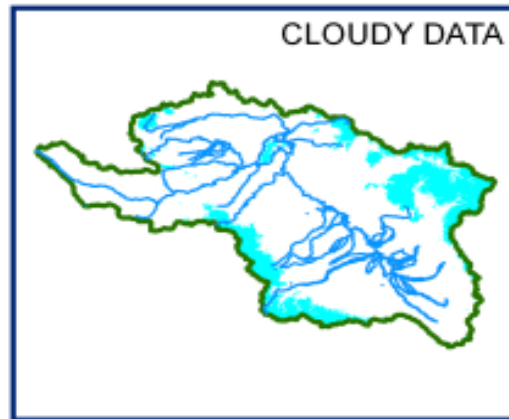


SNOW COVER MAP:

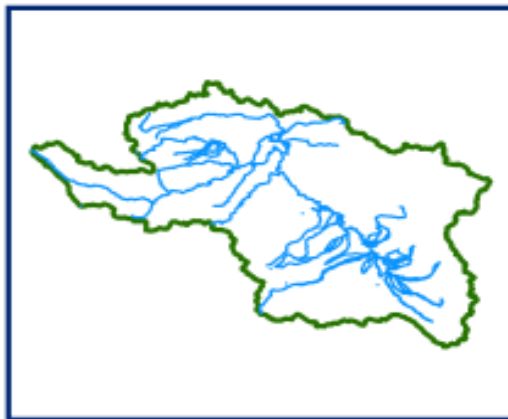
JHELUM BASIN



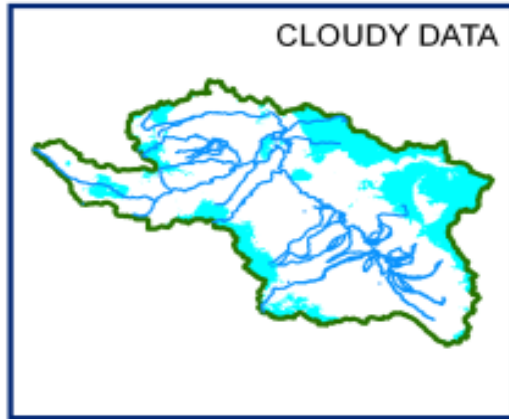
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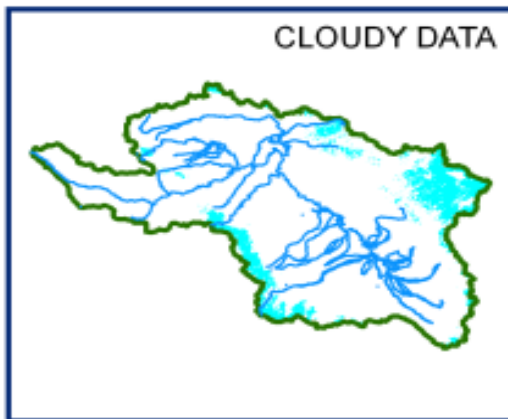
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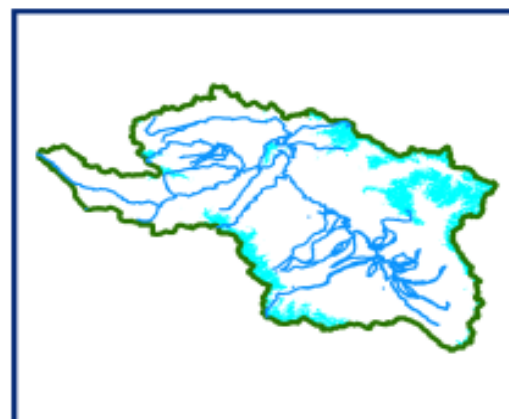
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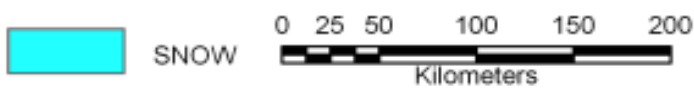
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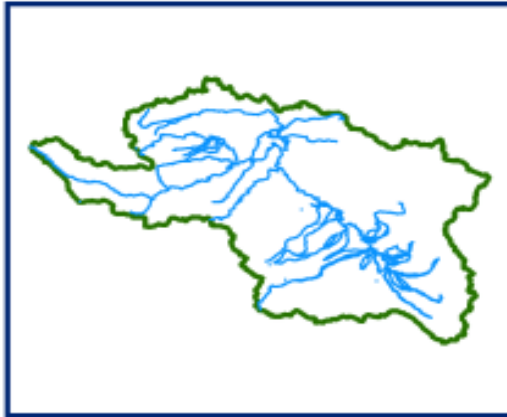
22 MAY 2014



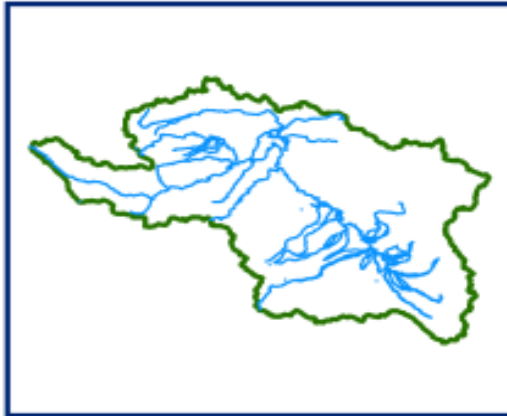
27 MAY 2014



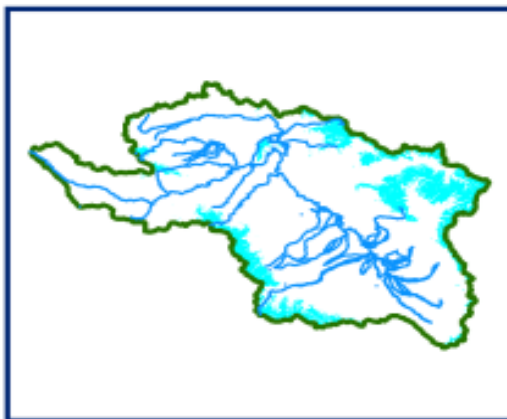
10 DAILY SNOW COVER MAP: JHELUM BASIN



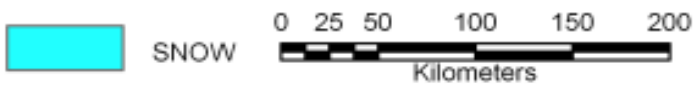
DATA USED
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DATA USED
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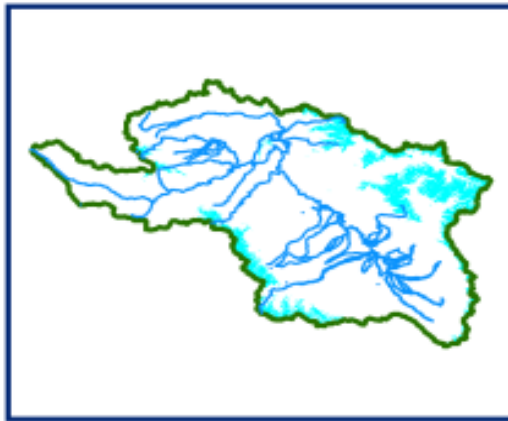


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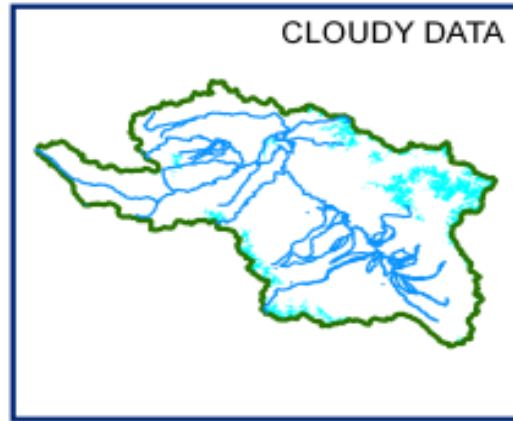


SNOW COVER MAP:

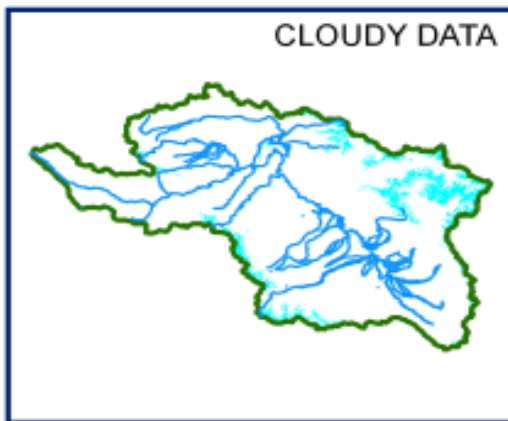
JHELUM BASIN



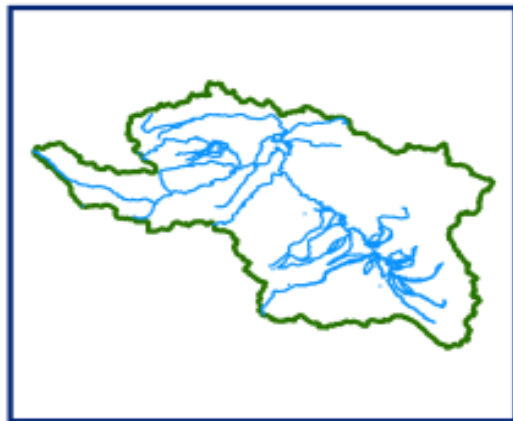
05 JUNE 2014



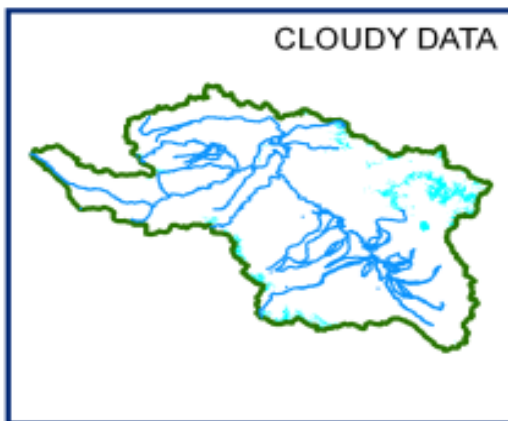
10 JUNE 2014



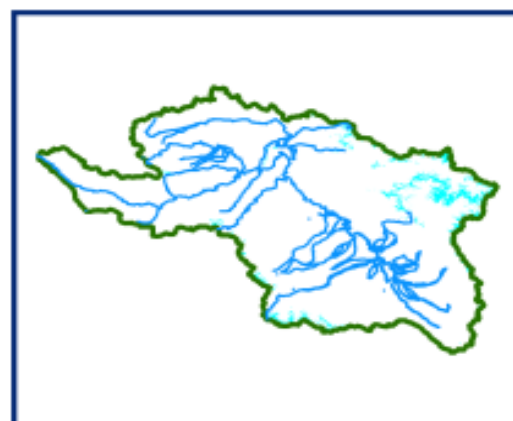
15 JUNE 2014



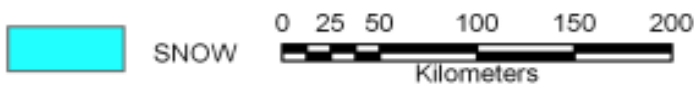
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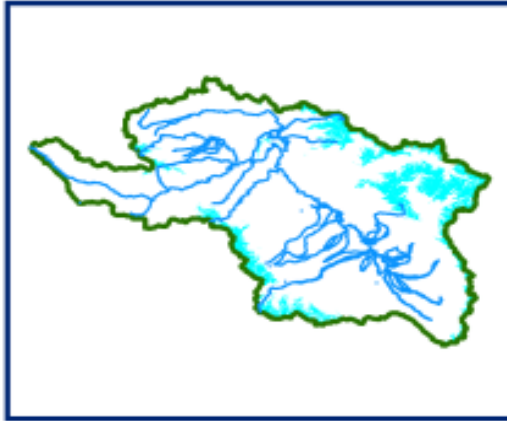
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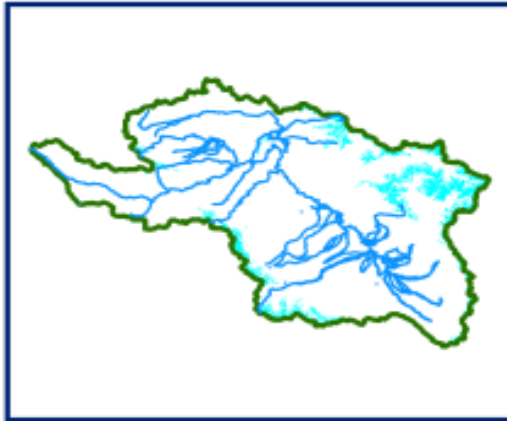
27 JUNE 2014



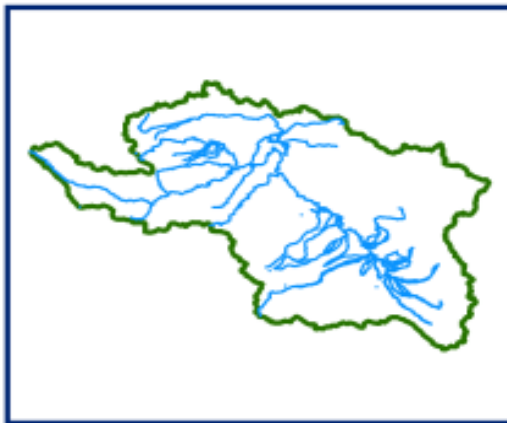
10 DAILY SNOW COVER MAP: JHELUM BASIN



DATA USED
05 JUNE 2014



DATA USED
15 JUNE 2014



DATA USED
DATA NOT AVAILABLE



SNOW

