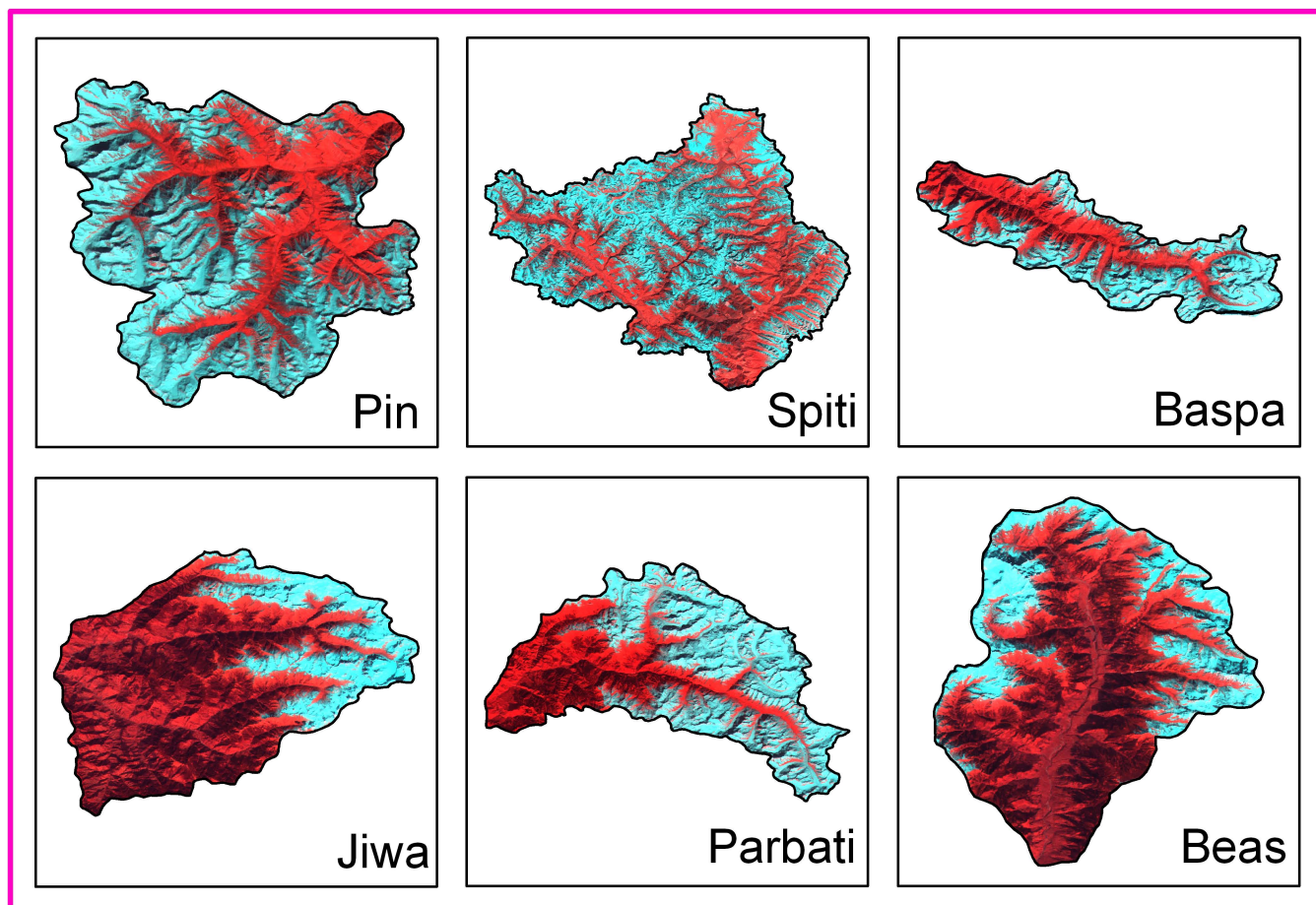


SNOW COVER ATLAS OF SATLUJ BASIN

Sub basins: Pin, Spiti, Baspa, Jiwa, Parbati and Beas

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

Year : 2010-11



State Centre on Climate Change
(State Council for Science Technology & Environment, Shimla),
Himachal Pradesh

and

Space Applications Centre (ISRO)
Ahmedabad - 380015

April, 2012

SNOW COVER ATLAS OF THE SATLUJ BASIN

Sub-basins: Pin, Spiti, Baspa, Jiwa, Parbati and Beas

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

(2009-10)



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

November 2012

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

Report Number	SAC/EP SA/MPSG/ GSD /SGP/SN/ 72 /2012
Month and year of publication	November, 2012
Title	Snow cover Atlas of the Satluj basin
Type of Report	Scientific Report
No. of pages	142
No. of figures, Charts & Tables	110, 18 & 12
Authors	B. P. Rathore, S. K. Singh, I. Bahuguna, A. S. Rajawat and Ajai
No. of References	9
Originating Unit	Geo Sciences Division, Marine, Geo and Planetary Sciences Group, Earth, Ocean, Atmosphere, Planetary Sciences and Applications area, Space Applications Centre (ISRO), Ahmedabad-15
Abstract	This atlas gives subbasin-wise distribution of snow cover in the Satluj basin from October 2009 to June 2010. The subbasins included in this report are Pin, Spiti, Baspa, Jiwa, Parbati and Beas. 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 curves. It is expected that this data will be useful for hydrological and climatological applications.
Key words	Snow cover, NDSI, AWiFS, depletion curve, Pin, Spiti, Baspa, Jiwa, Parbati and Beas basins.
Security Classification	Unrestricted
Distribution	As per list

CONTENTS

	Page No.
1. INTRODUCTION	1
2. STUDY AREA	2
3. DATA USED	2
4. NORMALISED DIFFERENCE SNOW INDEX	2
5. SNOW COVER MONITORING ALGORITHM	3
6. RESULTS AND DISCUSSIONS	4
PIN BASIN	8
SPITI BASIN	31
BASPA BASIN	54
JIWA BASIN	77
PARBATI BASIN	99
BEAS BASIN	121

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:

The study area comprises of distribution of snow cover in Pin, Spiti, Baspa, Jiwa, Parbati and Beas sub basins of Satluj basin. The location map of these sub basins is as per Figure 1.

3. Data used:

AWiFS data from October 2009 to June 2010 was used in this study.

4. Normalised Difference Snow Index (NDSI):

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

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

$$\text{Normalized Difference Snow Index(NDSI)} = (\text{band2} - \text{band5}) / (\text{band2} + \text{band5}) \quad \dots(1)$$

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 curve is given from October 2009 to June 2010. Snow ablation pattern varies from basin to basin, depending on area altitude distribution in the basins. For example, in the Jiwa river basin, which is located in lower altitude zone and contains few glaciers has shown and ablation of snow through out the winter season. However, in case of Pin basin, located in high altitude region and large area is covered by glaciers has shown little or no ablation from November to March. For a period between October to December, snow ablation was observed in Spiti, Jiwa and Beas basins.

Acknowledgements

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

References

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

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

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

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

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

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

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

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

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

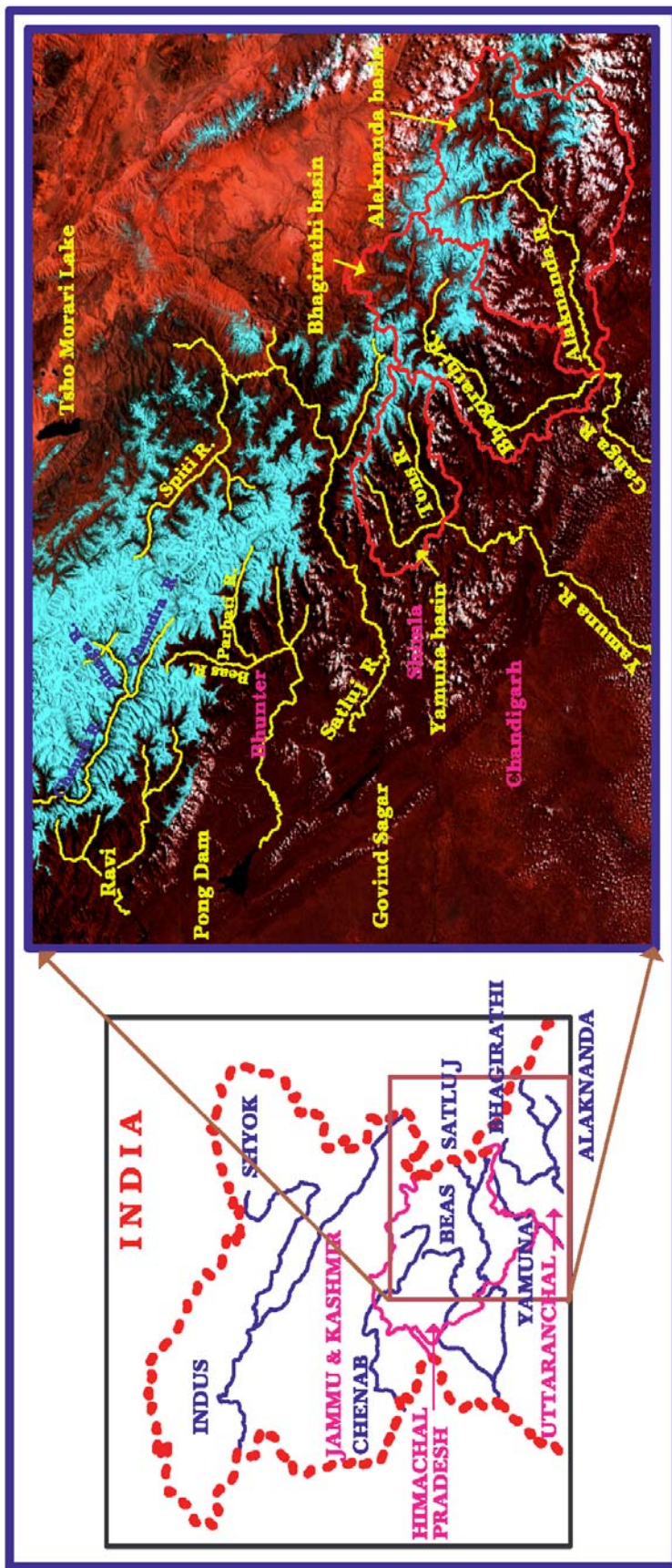


Figure 1: Location map of Alaknanda, Bhagirathi and Yamuna sub-basins (Part of Ganga basin)

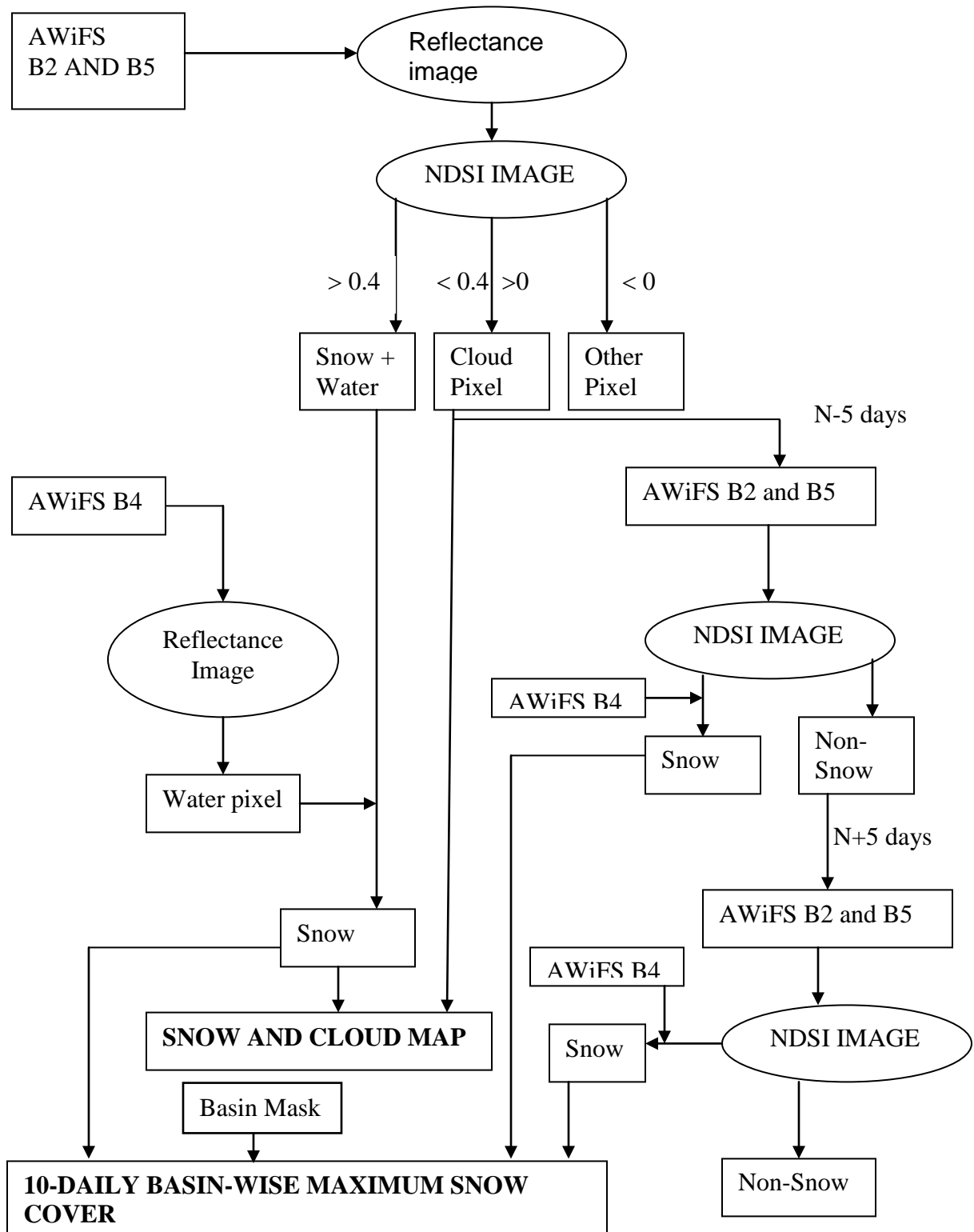


Figure 2: Algorithm for snow cover mapping using AWiFS data

PIN BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: PIN

BASIN AREA: 1266 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009							
1	3-Oct-09	707.0	56	2	4-Oct-09	577.5	46
3	8-Oct-09	692.2	55	4	9-Oct-09	655.4	52
5	18-Oct-09	1213.6	96	6	27-Oct-09	789.5	62
7	28-Oct-09	601.2	47				
November 2009							
8	1-Nov-09	709.9	56	9	2-Nov-09	672.6	53
10	6-Nov-09	673.7	53	11	11-Nov-09	1259.4	99
12	20-Nov-09	1241.6	98	13	21-Nov-09	1238.0	98
14	25-Nov-09	1212.7	96	15	26-Nov-09	1206.4	95
16	30-Nov-09	1160.8	92				
December 2009							
17	10-Dec-09	1001.9	79	18	14-Dec-09	1266.0	100
19	19-Dec-09	1266.0	100	20	20-Dec-09	1266.0	100
21	24-Dec-09	1262.0	100	22	29-Dec-09	584.0	46
January 2010							
23	8-Jan-10	1265.3	100	24	27-Jan-10	1146.9	91
25	31-Jan-10	1220.0	96				
February 2010							
26	5-Feb-10	1239.2	98	27	6-Feb-10	1122.3	89
28	10-Feb-10	1266.0	100				
March 2010							
29	11-Mar-10	1266.0	100				
April 2010							
30	4-Apr-10	1136.8	90	31	19-Apr-10	1251.5	99
May 2010							
32	8-May-10	979.7	77	33	22-May-10	966.0	76
34	31-May-10	942.2	74				
June 2010							
35	1-Jun-10	845.6	67	36	5-Jun-10	699.9	55
37	6-Jun-10	792.4	63	38	20-Jun-10	797.4	63
39	24-Jun-10	693.6	55	40	29-Jun-10	673.0	53
July 2010							
41	14-Jul-10	614.4	49				

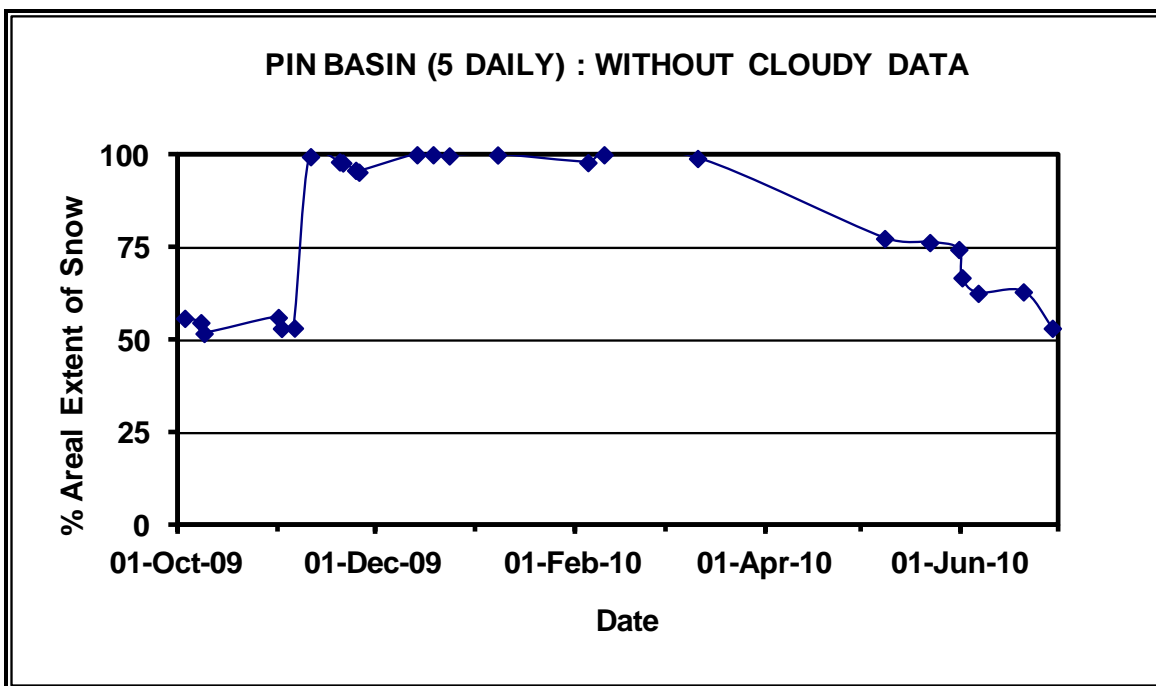
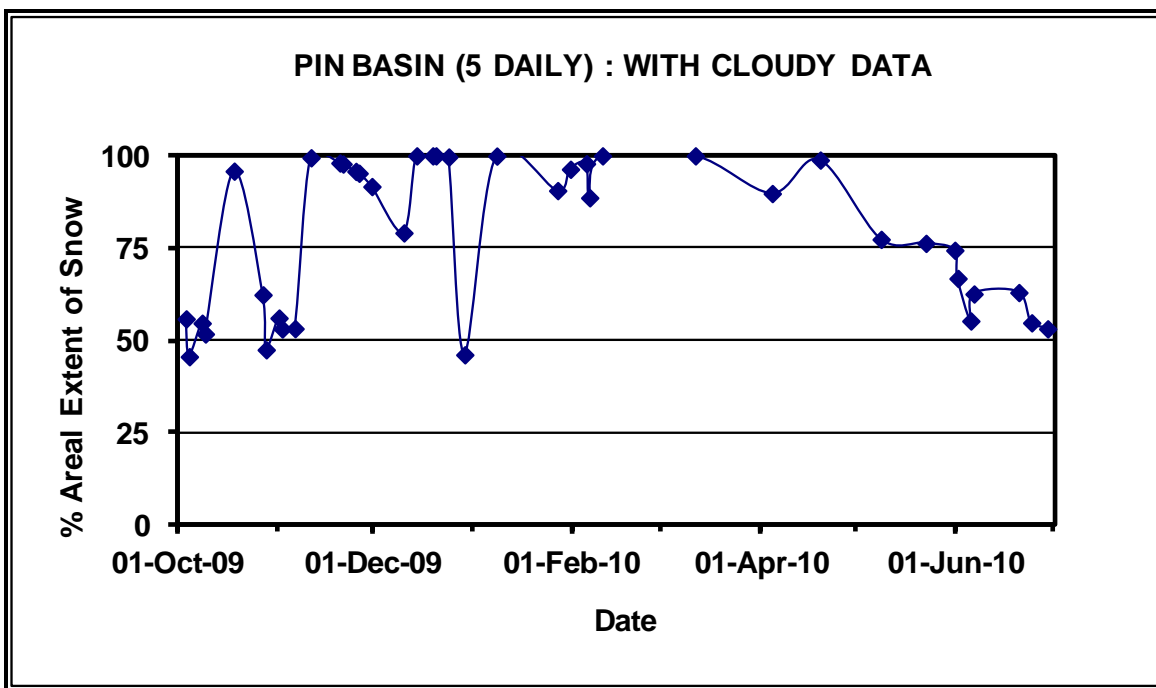
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: PIN

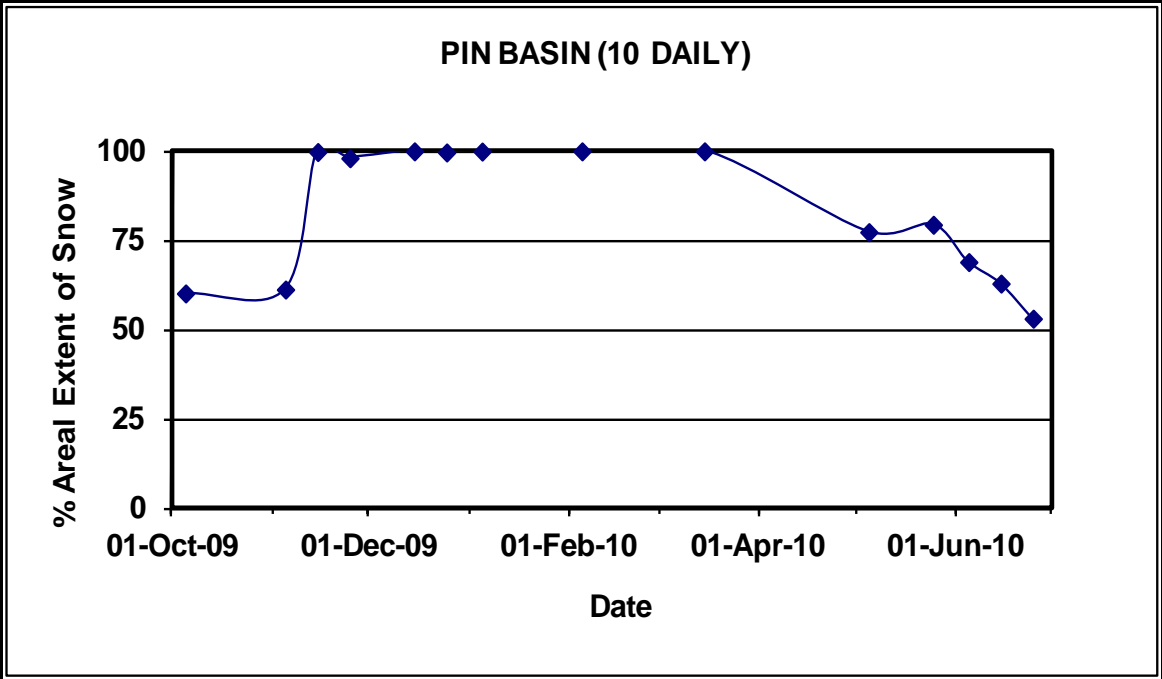
BASIN AREA: 1266 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009				November 2009			
1	8-Oct-09	762.4	60	2	2-Nov-09	776.3	61
				3	11-Nov-09	1263.6	100
				4	25-Nov-09	1241.7	98
December 2009				January 2010			
5	19-Dec-09	1266.0	100	7	8-Jan-10	1265.3	100
6	24-Dec-09	1262.0	100				
February 2010				March 2010			
8	5-Feb-10	1266.0	100	9	11-Mar-10	1266.0	100
April 2010				May 2010			
				10	8-May-10	979.7	77
				11	22-May-10	1005.8	79
June 2010				July 2010			
12	1-Jun-10	873.6	69	15	14-Jul-10	614.4	49
13	20-Jun-10	797.4	63				
14	29-Jun-10	673.0	53				

Snow cover depletion curve

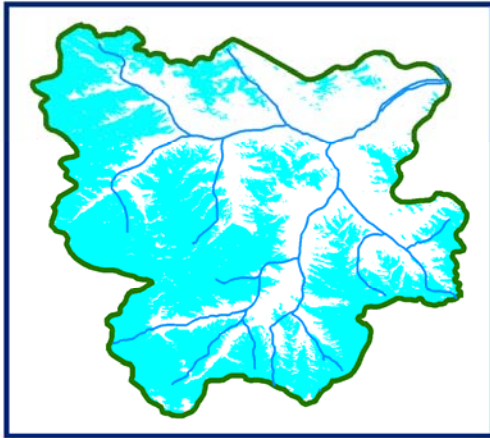


Snow cover depletion curve

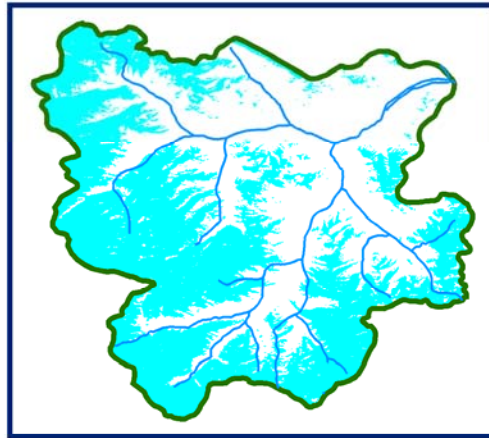


SNOW COVER MAP

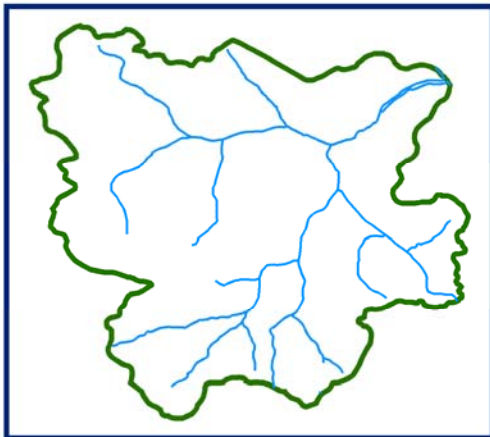
SNOW COVER MAP : PIN BASIN



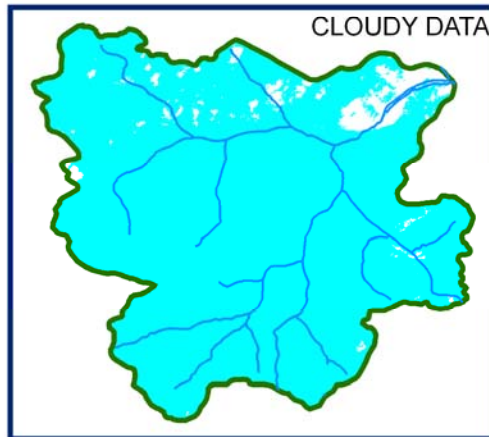
03 OCTOBER 2009



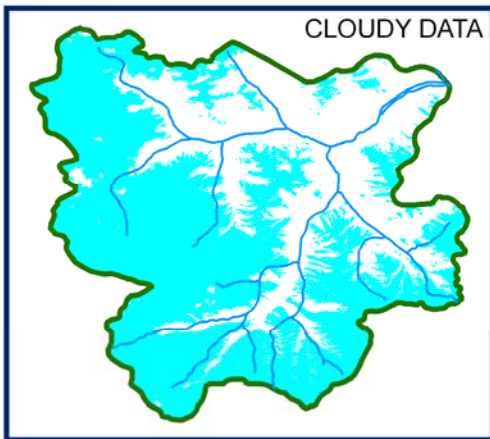
09 OCTOBER 2009



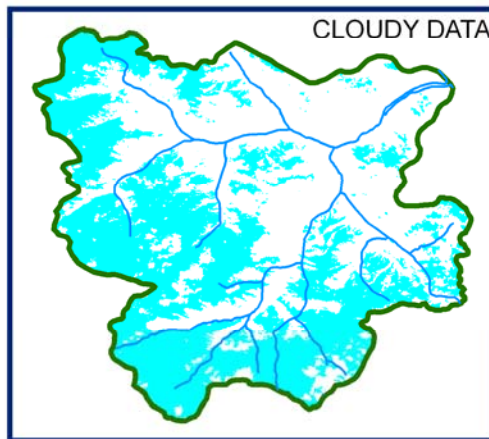
DATA NOT AVAILABLE



18 OCTOBER 2009



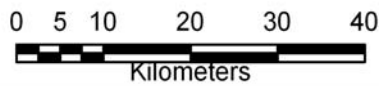
27 OCTOBER 2009



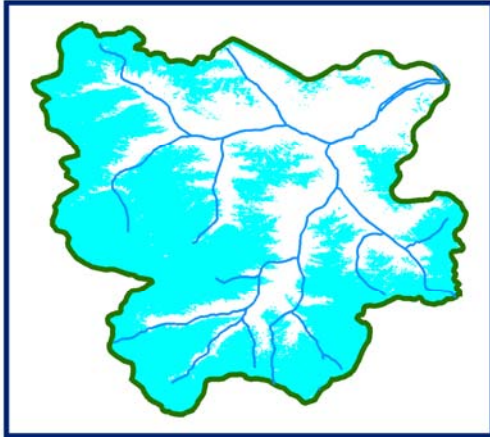
28 OCTOBER 2009



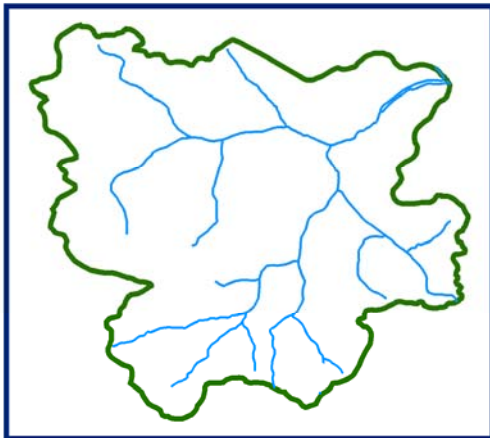
SNOW



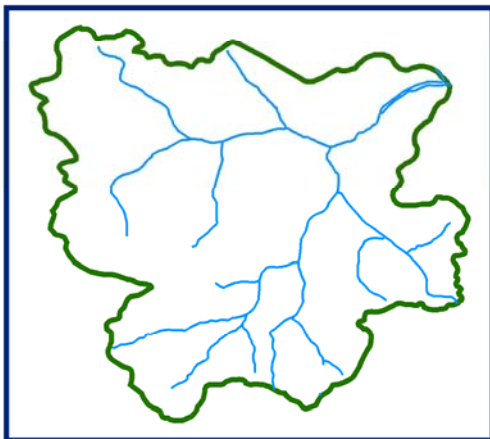
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
03 OCTOBER 2009
08 OCTOBER 2009
09 OCTOBER 2009



DATA USED
DATA NOT AVAILABLE



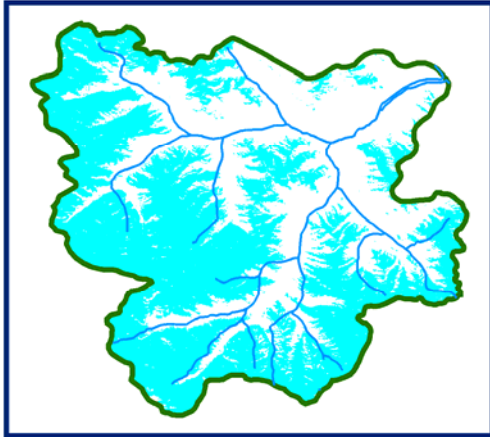
DATA USED
DATA NOT AVAILABLE



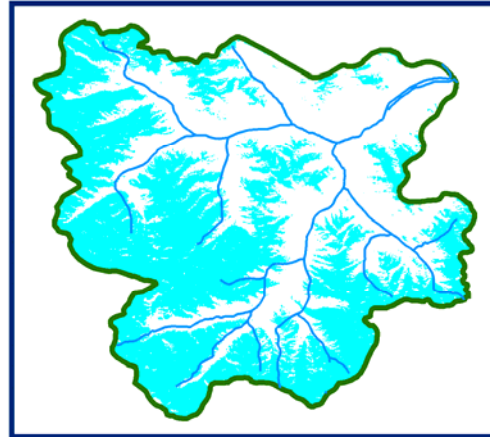
SNOW



SNOW COVER MAP : PIN BASIN



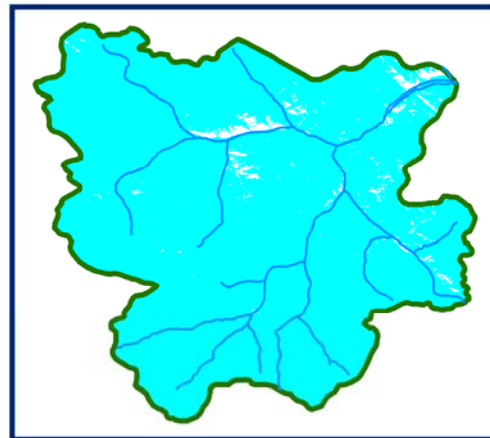
01 NOVEMBER 2009



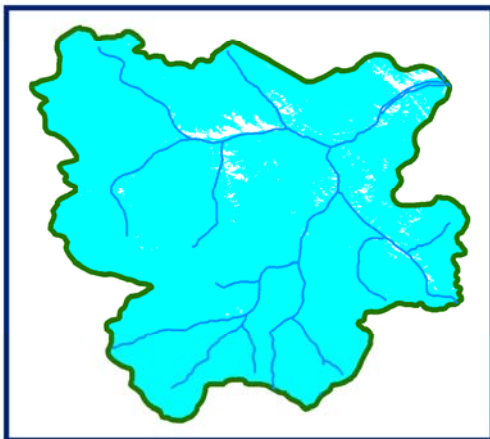
06 NOVEMBER 2009



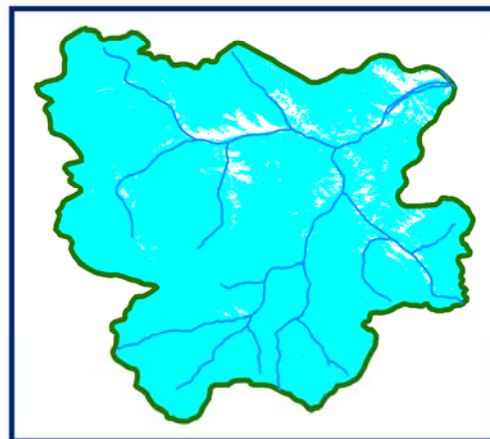
11 NOVEMBER 2009



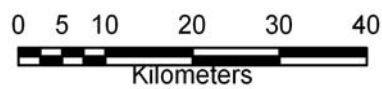
20 NOVEMBER 2009



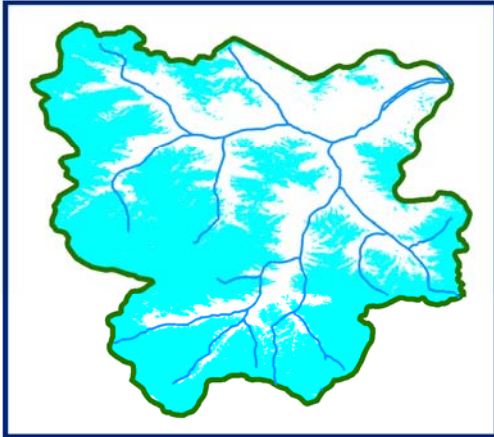
21 NOVEMBER 2009



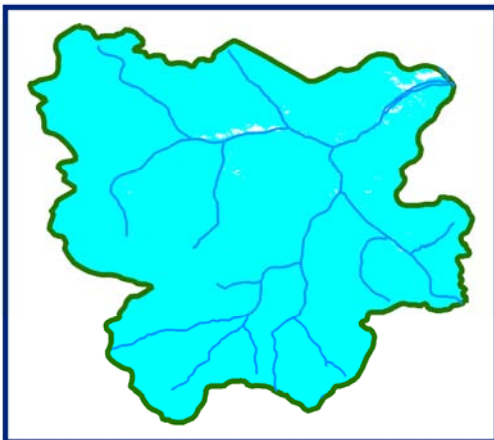
26 NOVEMBER 2009



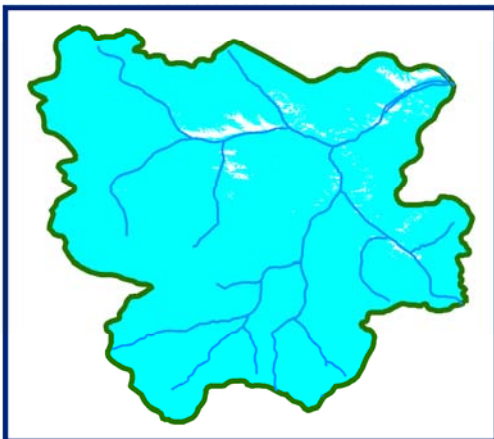
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
01 NOVEMBER 2009
02 NOVEMBER 2009
06 NOVEMBER 2009



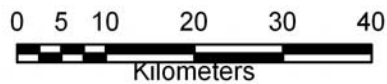
DATA USED
11 NOVEMBER 2009
20 NOVEMBER 2009



DATA USED
21 NOVEMBER 2009
25 NOVEMBER 2009
26 NOVEMBER 2009



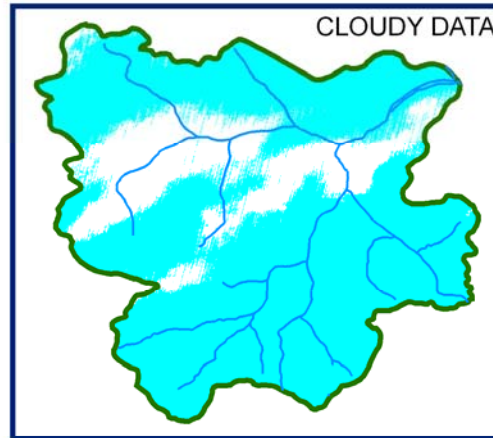
SNOW



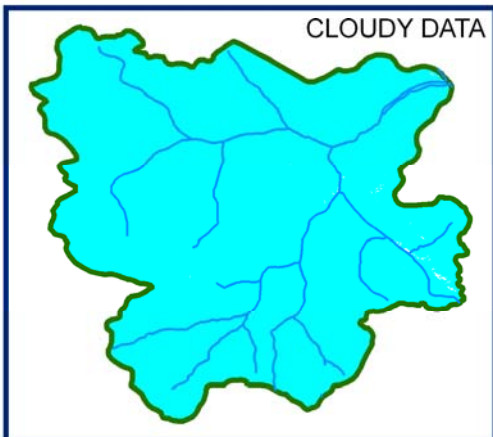
SNOW COVER MAP : PIN BASIN



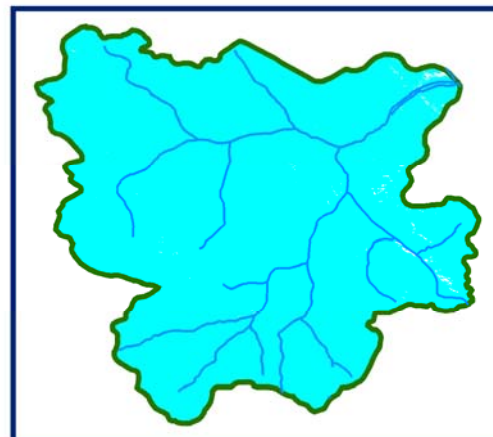
DATA NOT AVAILABLE



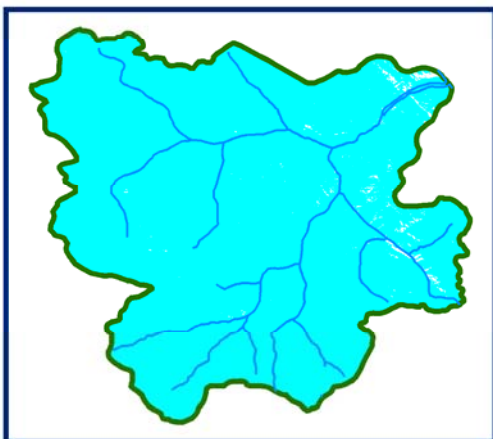
10 DECEMBER 2009



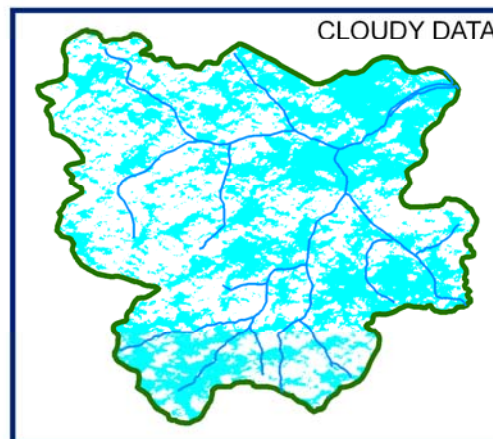
14 DECEMBER 2009



19 DECEMBER 2009



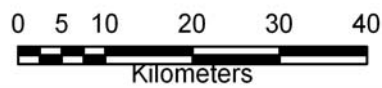
24 DECEMBER 2009



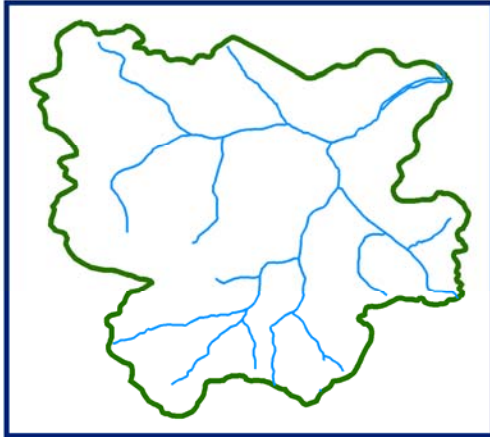
29 DECEMBER 2009



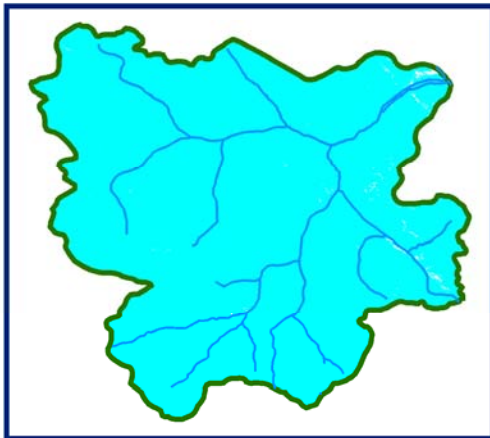
SNOW



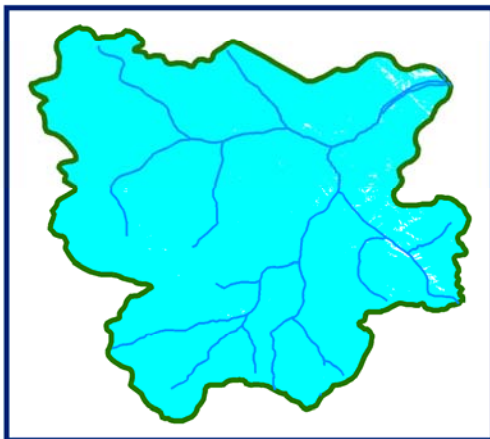
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
19 DECEMBER 2009



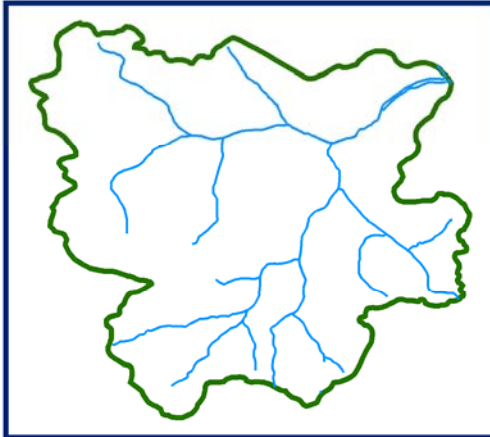
DATA USED
24 DECEMBER 2009



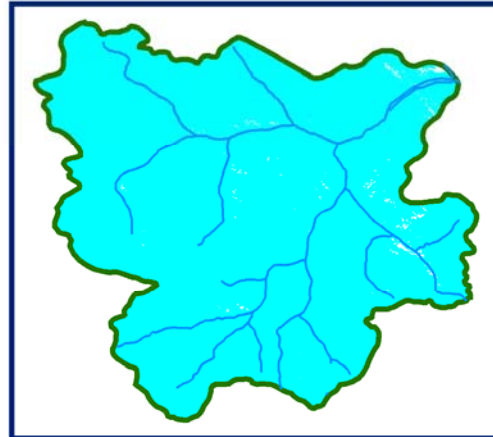
SNOW



SNOW COVER MAP : PIN BASIN



DATA NOT AVAILABLE



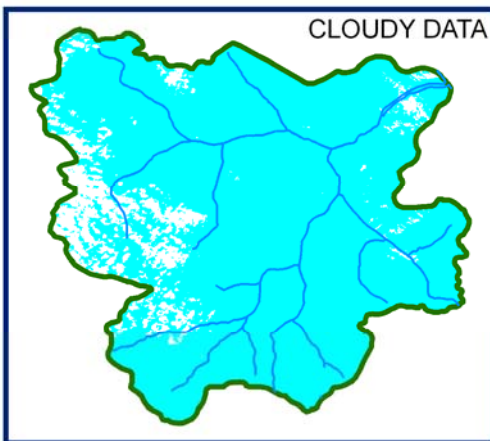
08 JANUARY 2010



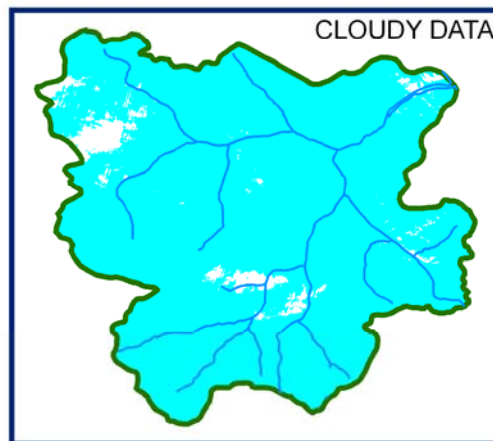
DATA NOT AVAILABLE



DATA NOT AVAILABLE



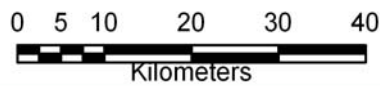
27 JANUARY 2010



31 JANUARY 2010



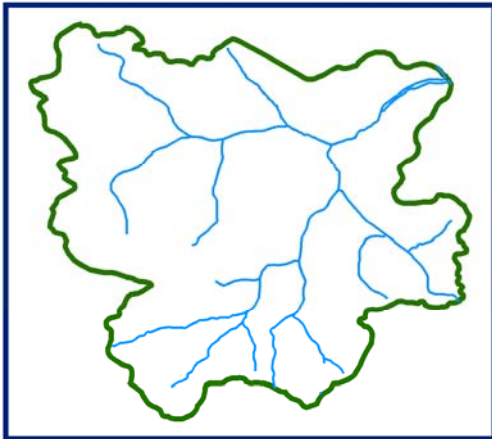
SNOW



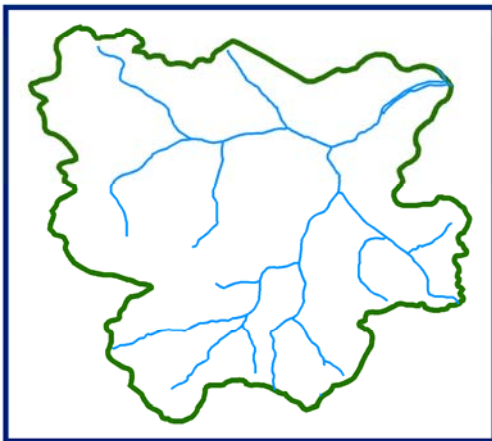
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
08 JANUARY 2010



DATA USED
DATA NOT AVAILABLE



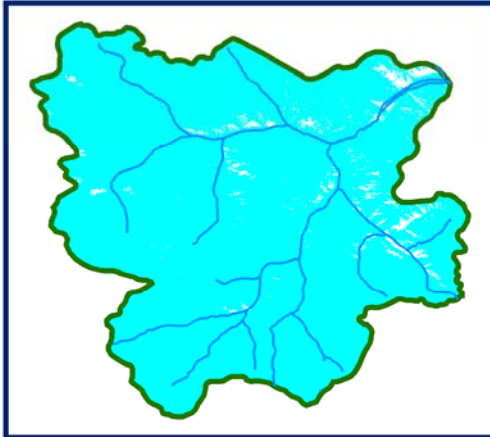
DATA USED
DATA NOT AVAILABLE



SNOW



SNOW COVER MAP : PIN BASIN



05 FEBRUARY 2010



10 FEBRUARY 2010



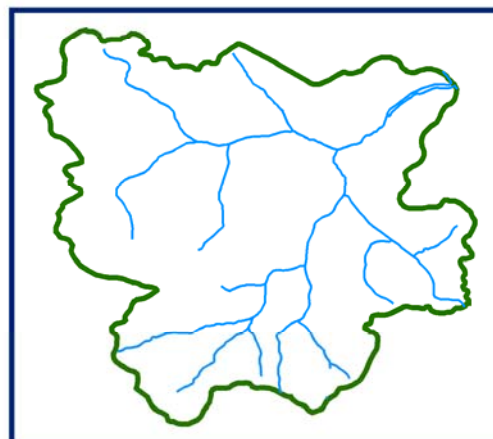
DATA NOT AVAILABLE



DATA NOT AVAILABLE



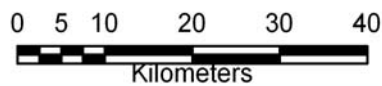
DATA NOT AVAILABLE



DATA NOT AVAILABLE



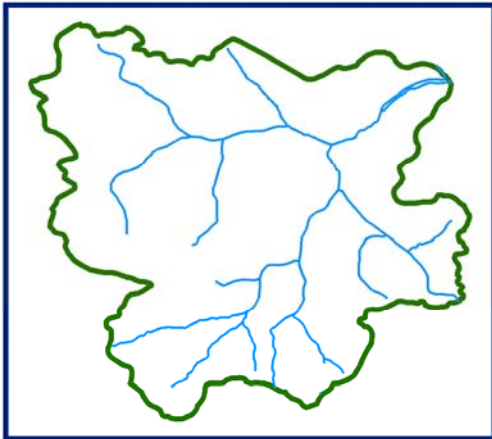
SNOW



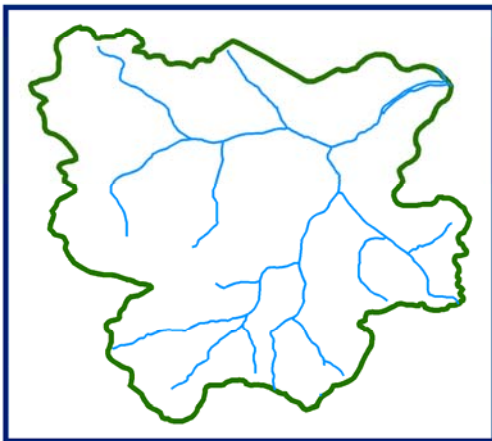
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
05 FEBRUARY 2010
10 FEBRUARY 2010



DATA USED
DATA NOT AVAILABLE



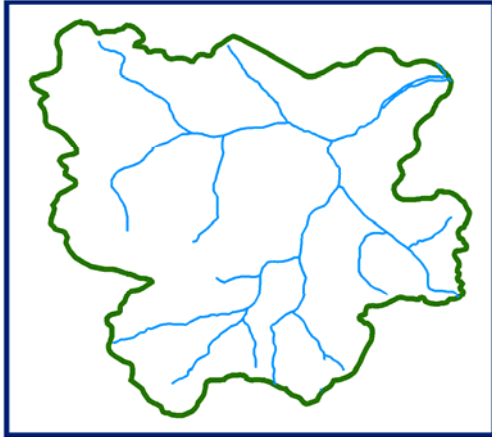
DATA USED
DATA NOT AVAILABLE



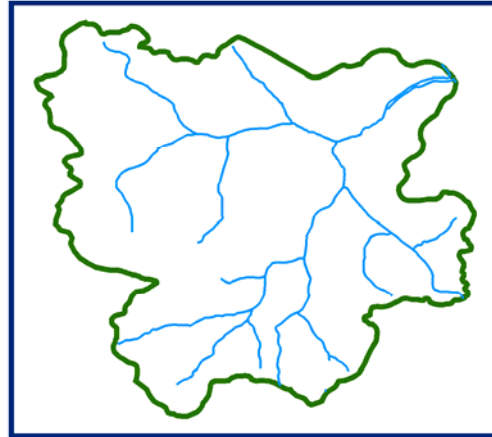
SNOW



SNOW COVER MAP : PIN BASIN



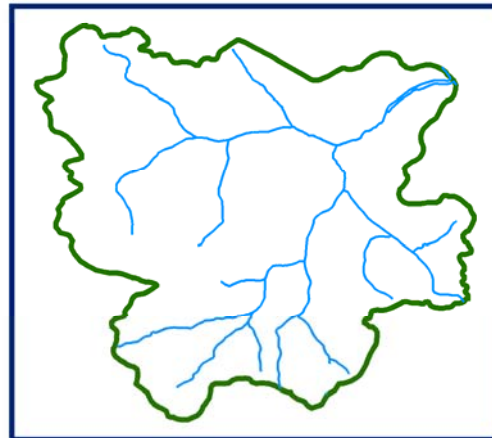
DATA NOT AVAILABLE



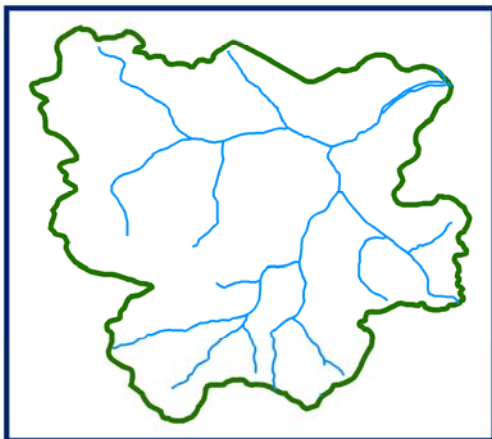
DATA NOT AVAILABLE



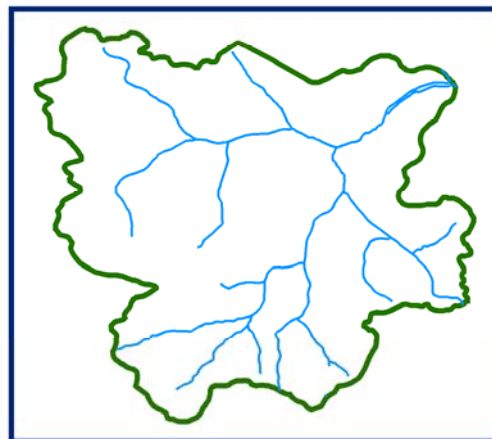
11 MARCH 2010



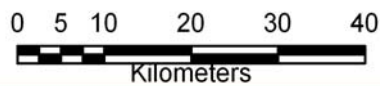
DATA NOT AVAILABLE



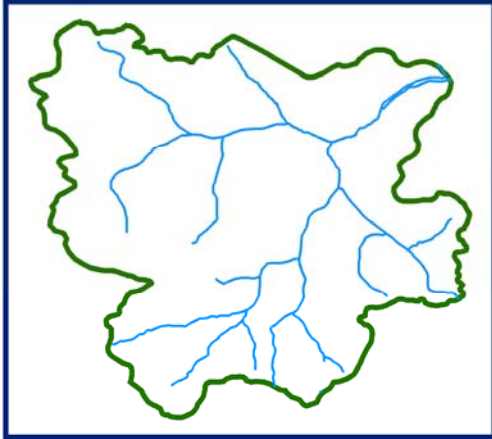
DATA NOT AVAILABLE



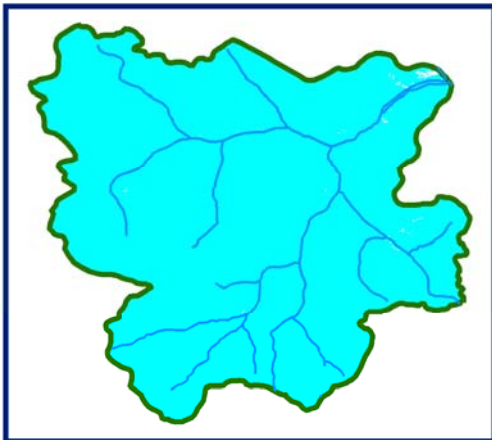
DATA NOT AVAILABLE



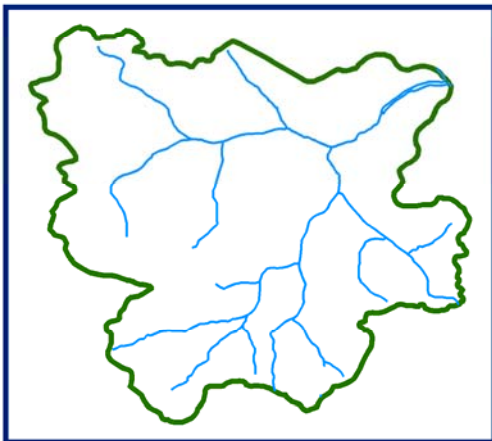
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
DATA NOT AVAILABLE



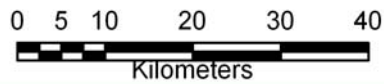
DATA USED
11 MARCH 2010



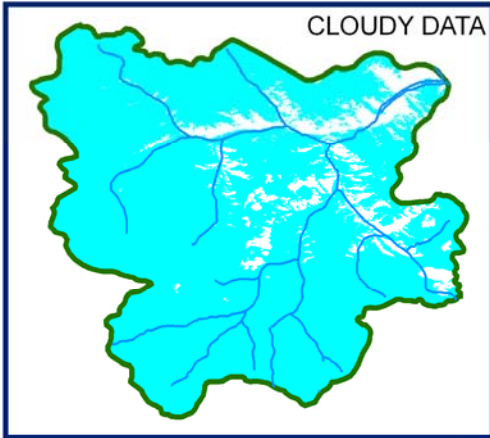
DATA USED
DATA NOT AVAILABLE



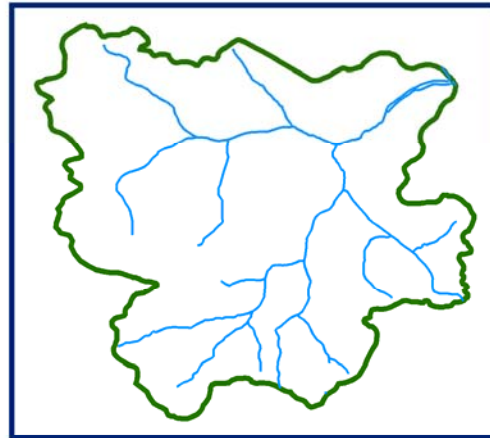
SNOW



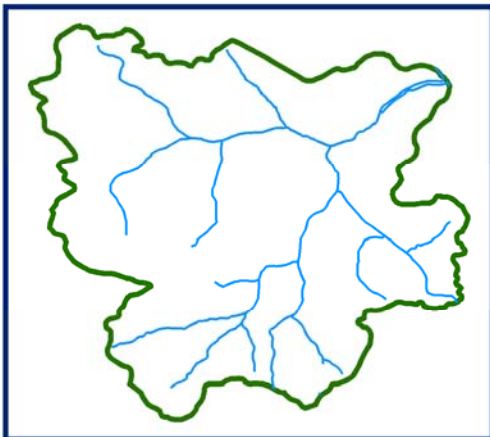
SNOW COVER MAP : PIN BASIN



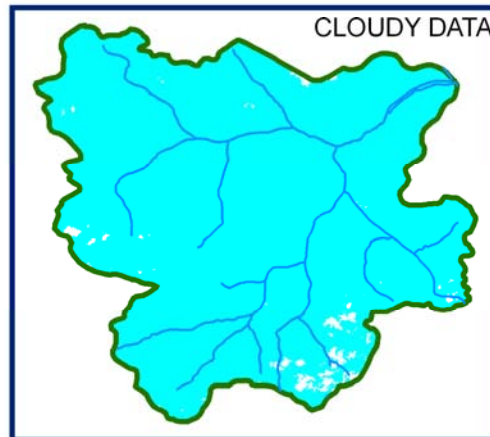
04 APRIL 2010



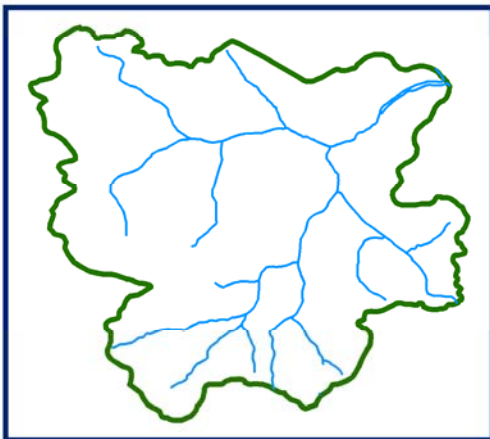
DATA NOT AVAILABLE



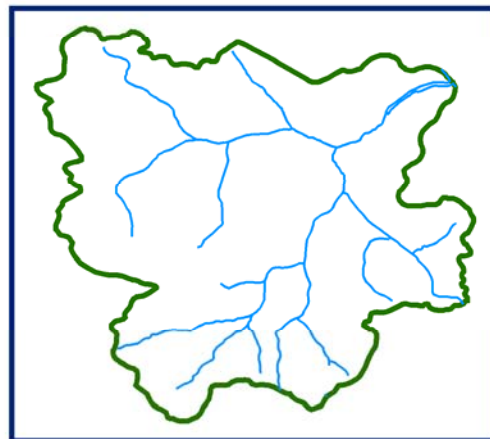
DATA NOT AVAILABLE



19 APRIL 2010



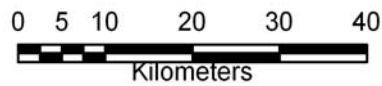
DATA NOT AVAILABLE



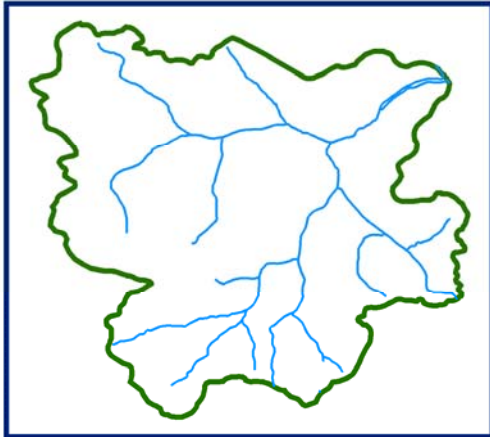
DATA NOT AVAILABLE



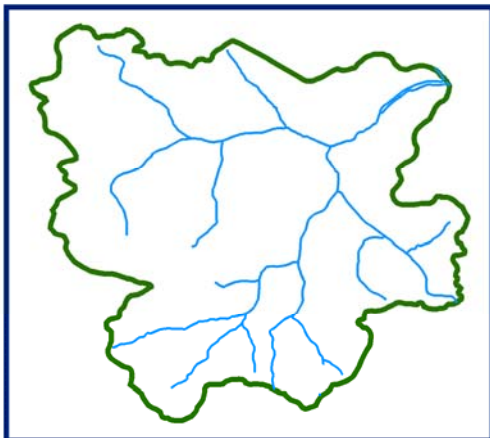
SNOW



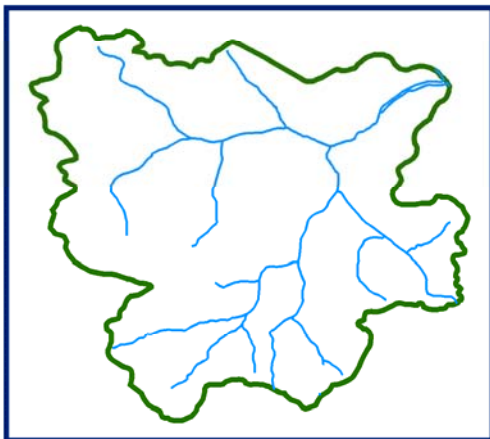
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
DATA NOT AVAILABLE



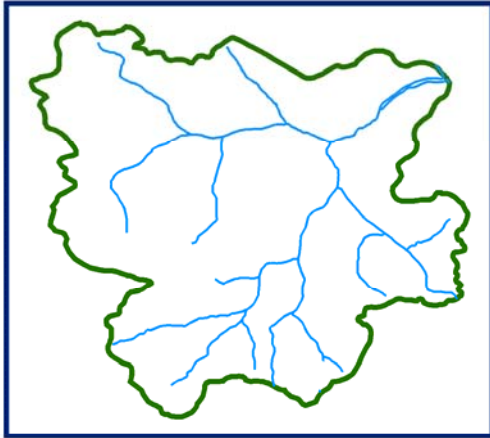
DATA USED
DATA NOT AVAILABLE



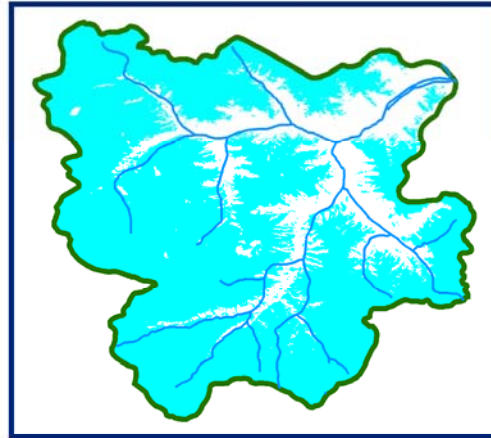
SNOW



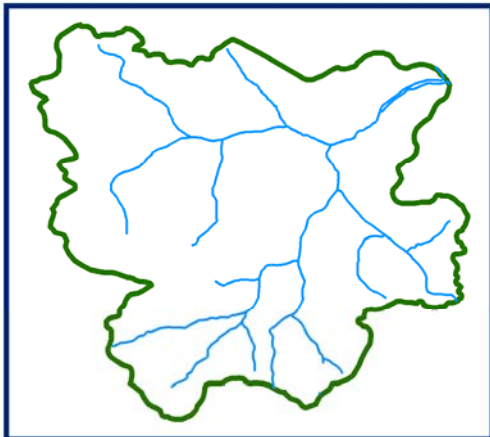
SNOW COVER MAP : PIN BASIN



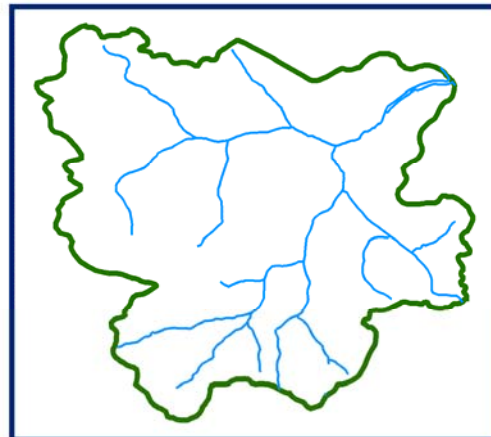
DATA NOT AVAILABLE



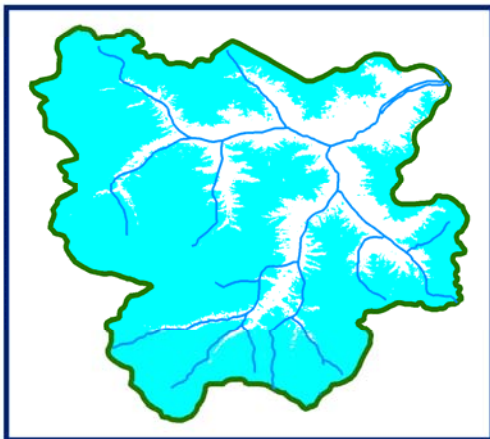
08 MAY 2010



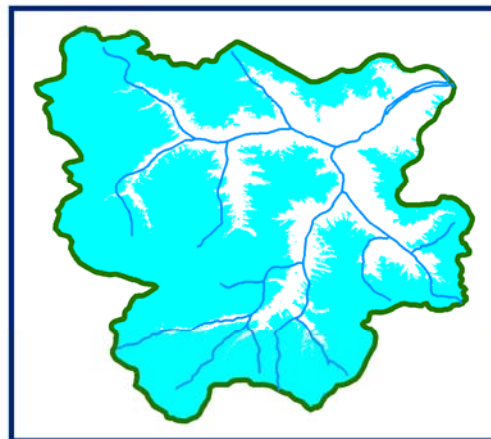
DATA NOT AVAILABLE



DATA NOT AVAILABLE



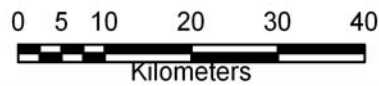
22 MAY 2010



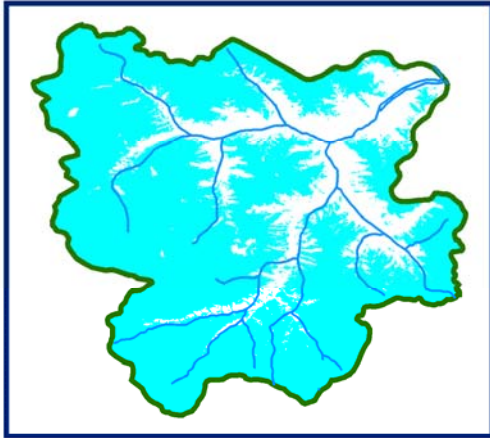
31 MAY 2010



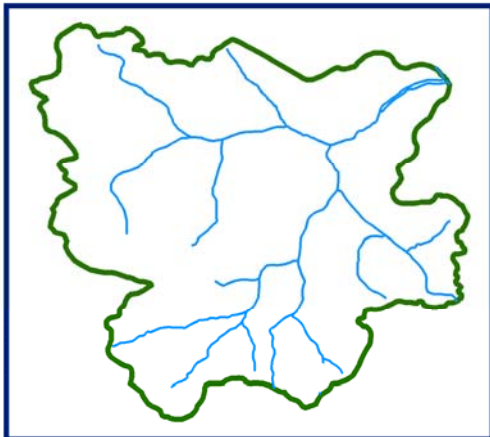
SNOW



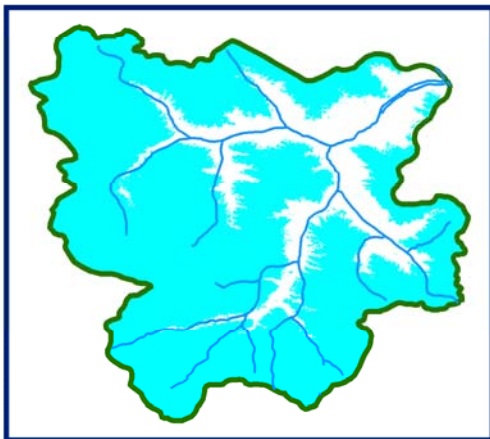
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
08 MAY 2010



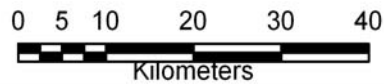
DATA USED
DATA NOT AVAILABLE



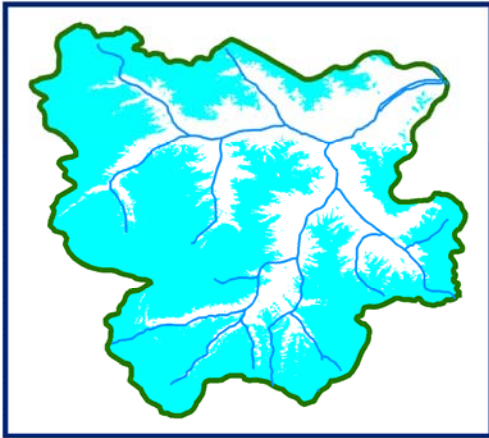
DATA USED
22 MAY 2010
31 MAY 2010



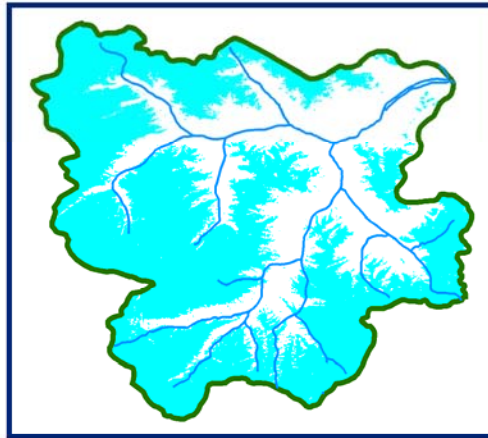
SNOW



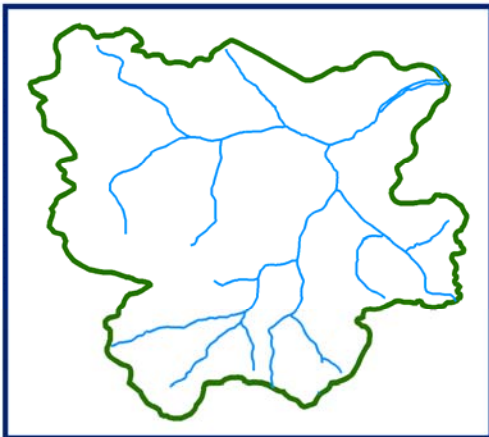
SNOW COVER MAP : PIN BASIN



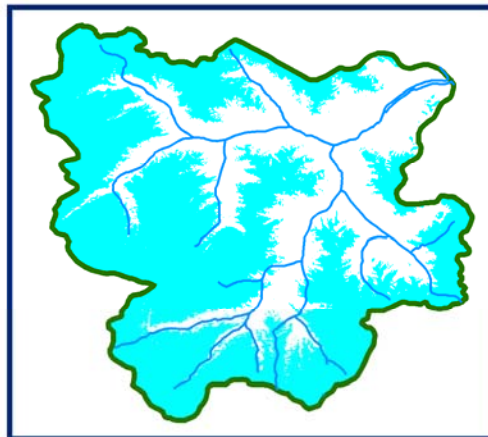
01 JUNE 2010



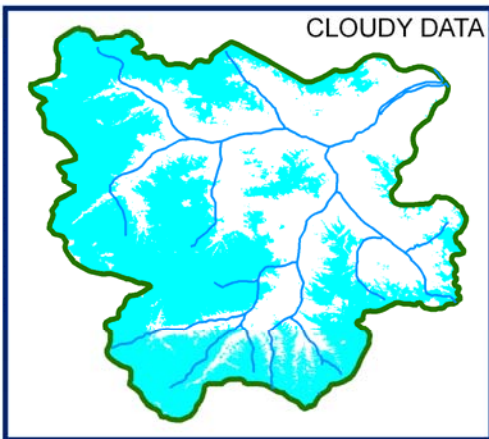
06 JUNE 2010



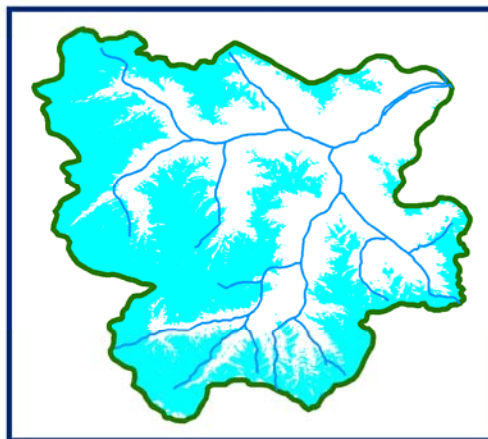
DATA NOT AVAILABLE



20 JUNE 2010



24 JUNE 2010



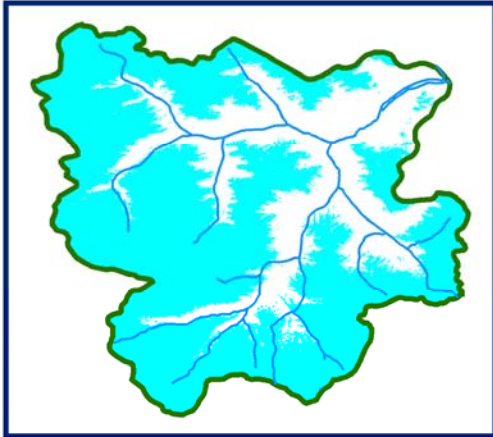
29 JUNE 2010



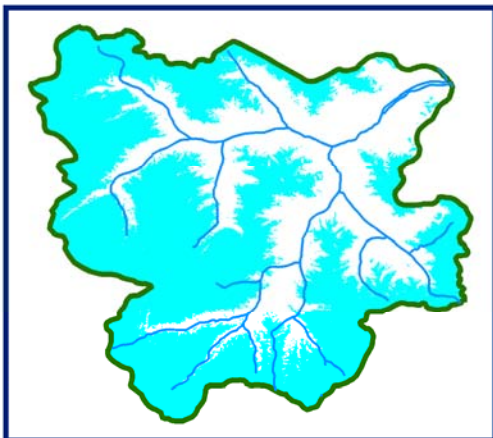
SNOW



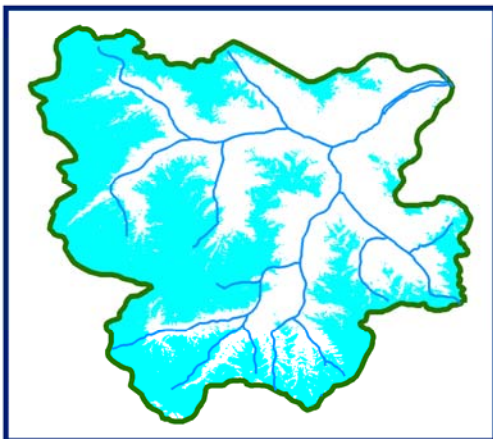
10 DAILY SNOW COVER MAP: PIN BASIN



DATA USED
01 JUNE 2010
06 JUNE 2010



DATA USED
20 JUNE 2010



DATA USED
29 JUNE 2010



SNOW



SPITI BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: SPITI

BASIN AREA: 8871 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009							
1	3-Oct-09	2825.7	32	2	4-Oct-09	2156.5	24
3	8-Oct-09	2681.0	30	4	9-Oct-09	2136.5	24
5	18-Oct-09	4272.4	48	6	27-Oct-09	2404.8	27
7	28-Oct-09	1910.0	22				
November 2009							
8	2-Nov-09	2193.6	25	9	6-Nov-09	2221.9	25
10	11-Nov-09	5800.7	65	11	21-Nov-09	6130.1	69
12	25-Nov-09	5649.9	64	13	26-Nov-09	5390.7	61
14	30-Nov-09	4468.8	50				
December 2009							
15	10-Dec-09	7135.2	80	16	14-Dec-09	6802.0	77
17	19-Dec-09	6877.9	78	18	20-Dec-09	6780.6	76
19	24-Dec-09	6416.9	72	20	29-Dec-09	2779.7	31
January 2010							
21	8-Jan-10	8331.3	94	22	27-Jan-10	6504.1	73
23	31-Jan-10	6853.4	77				
February 2010							
24	5-Feb-10	6741.7	76	25	6-Feb-10	5371.8	61
26	10-Feb-10	8495.1	96				
March 2010							
27	11-Mar-10	7703.6	87				
April 2010							
28	4-Apr-10	5071.9	57				
May 2010							
29	22-May-10	4338.6	49	30	31-May-10	3986.8	45
June 2010							
31	1-Jun-10	3369.5	38	32	5-Jun-10	1940.5	22
33	6-Jun-10	3206.9	36	34	20-Jun-10	3108.9	35
35	24-Jun-10	2060.8	23	36	29-Jun-10	2435.3	27
July 2010							
37	14-Jul-10	2076.1	23				

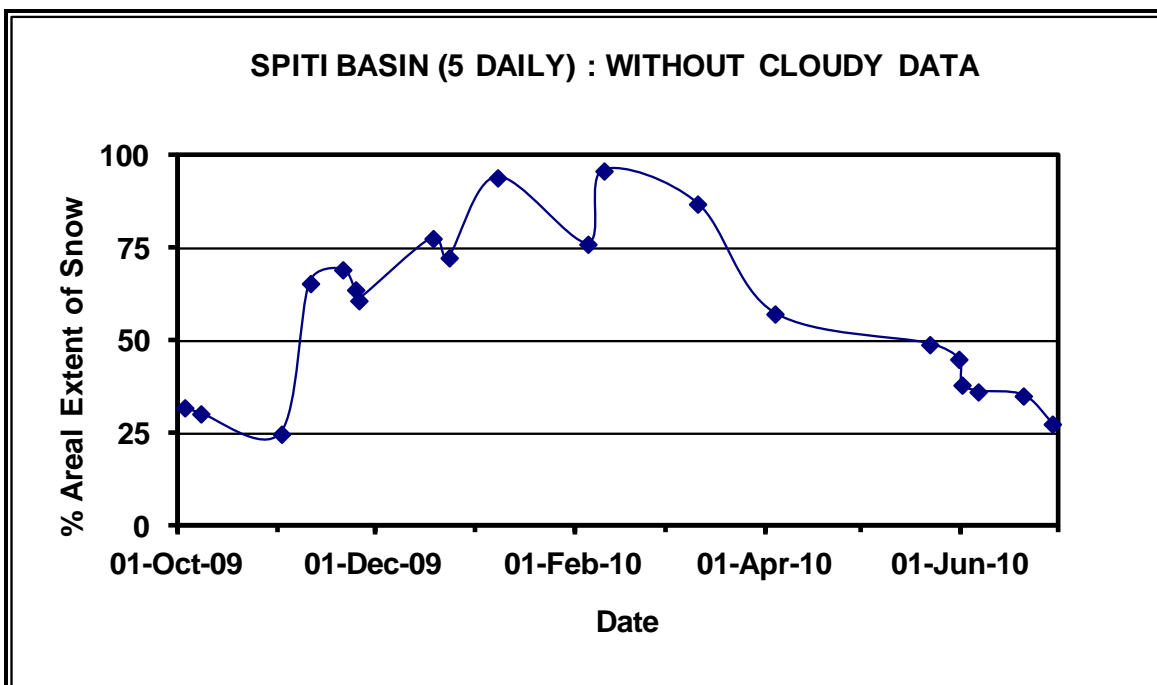
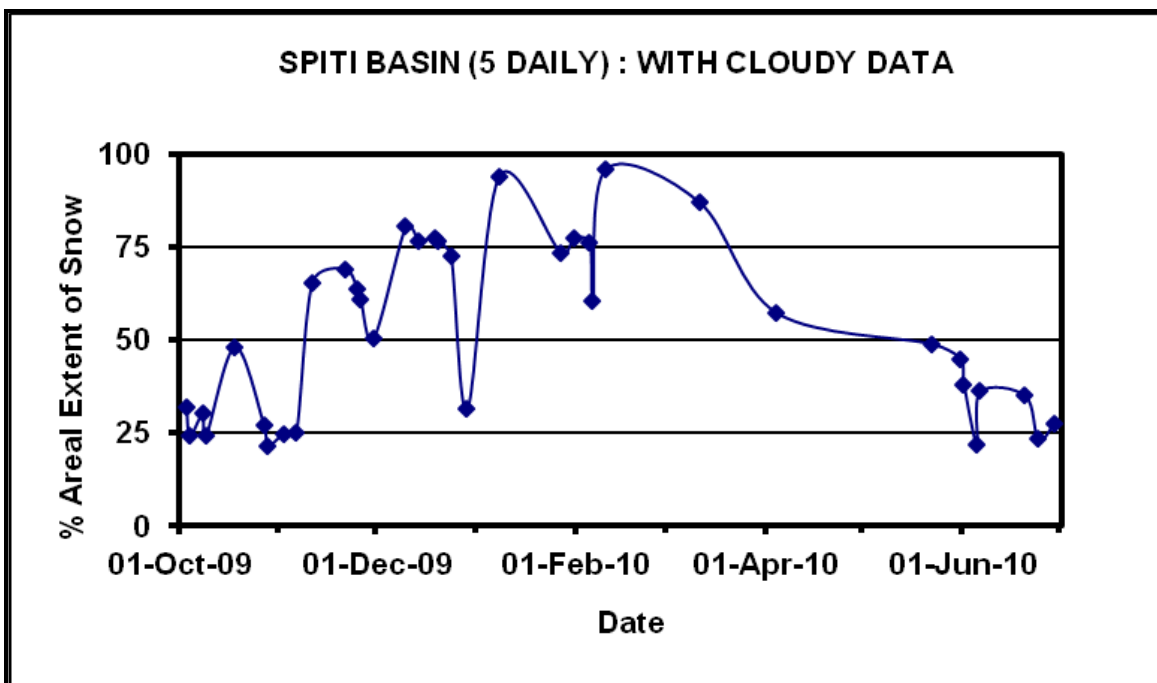
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: SPITI

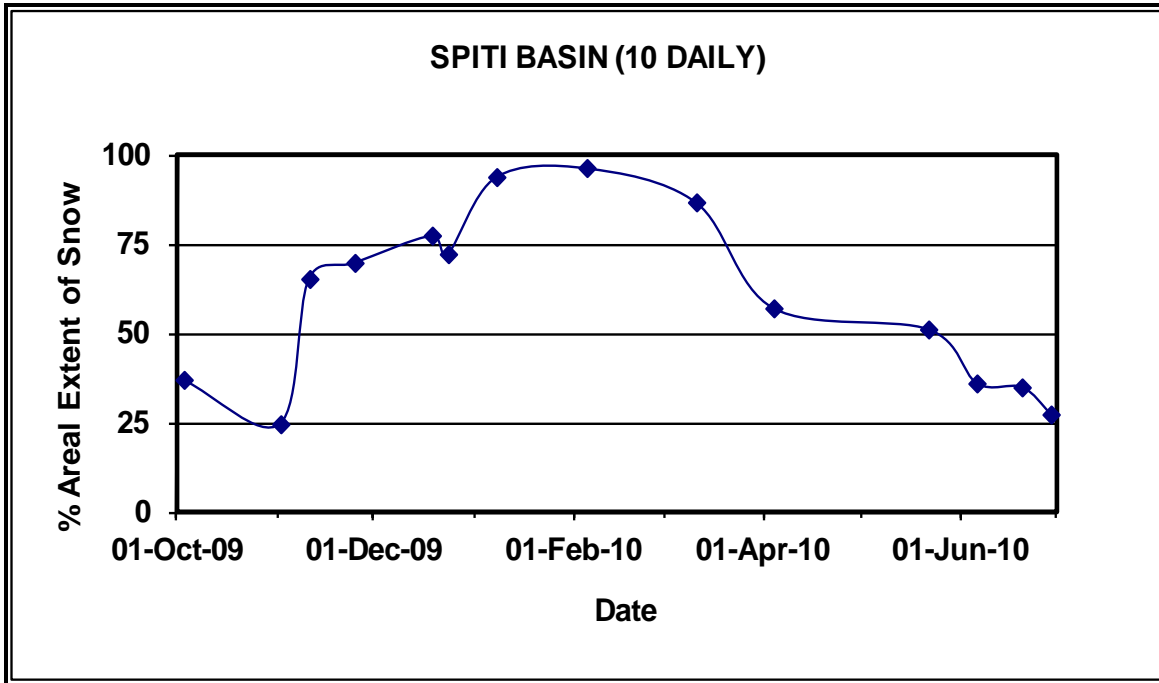
BASIN AREA: 8871 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009				November 2009			
1	3-Oct-09	3295.7	37	2	2-Nov-09	2193.6	25
				3	11-Nov-09	5800.7	65
				4	25-Nov-09	6200.4	70
December 2009				January 2010			
5	19-Dec-09	6877.9	78	7	8-Jan-10	8331.3	94
6	24-Dec-09	6416.9	72				
February 2010				March 2010			
8	5-Feb-10	8556.4	96	9	11-Mar-10	7703.6	87
April 2010				May 2010			
10	4-Apr-10	5071.9	57	11	22-May-10	4547.2	51
June 2010				July 2010			
12	6-Jun-10	3206.9	36	15	14-Jul-10	2076.1	23
13	20-Jun-10	3108.9	35				
14	29-Jun-10	2435.3	27				

Snow cover depletion curve

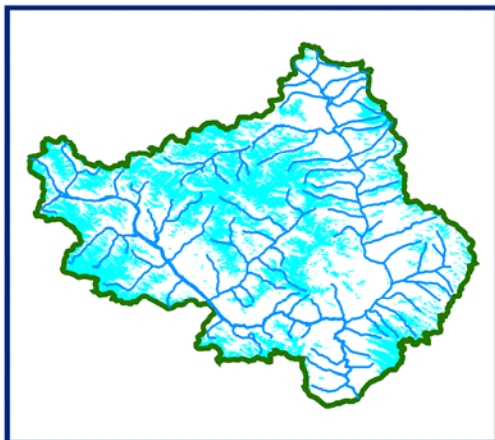


Snow cover depletion curve

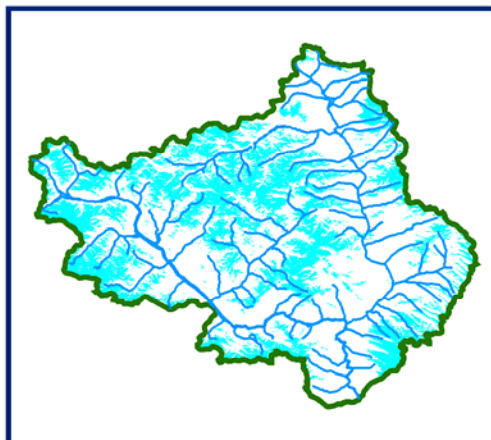


SNOW COVER MAP

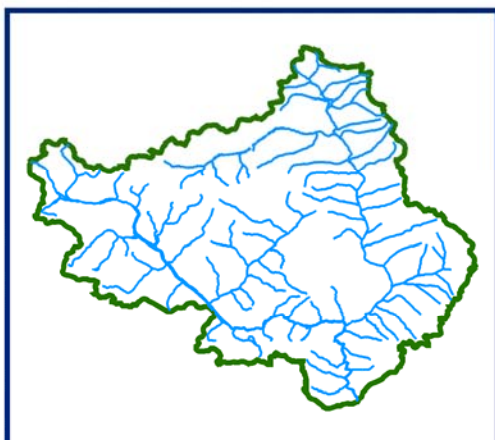
SNOW COVER MAP : SPITI BASIN



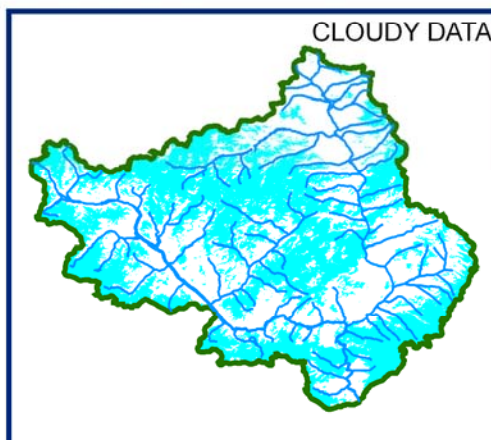
03 OCTOBER 2009



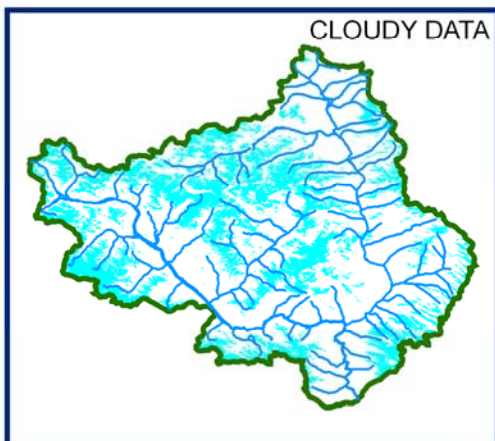
08 OCTOBER 2009



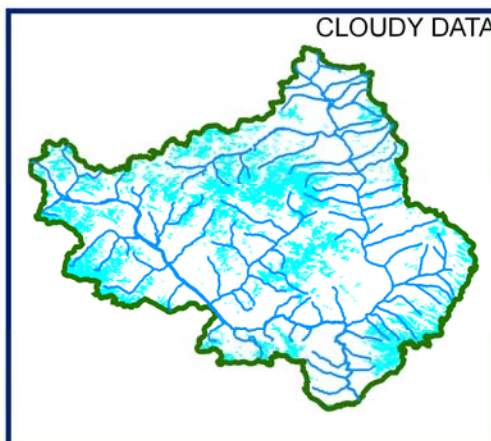
DATA NOT AVAILABLE



18 OCTOBER 2009



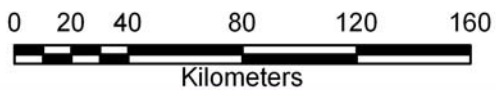
27 OCTOBER 2009



28 OCTOBER 2009



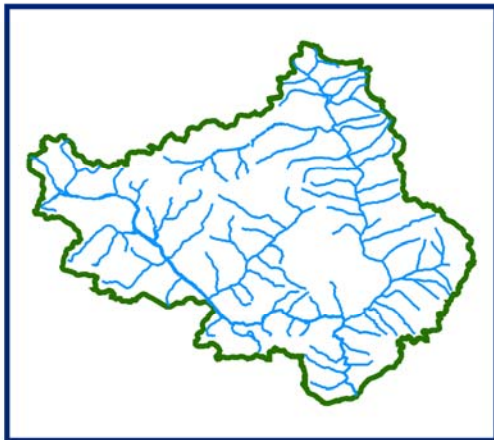
SNOW



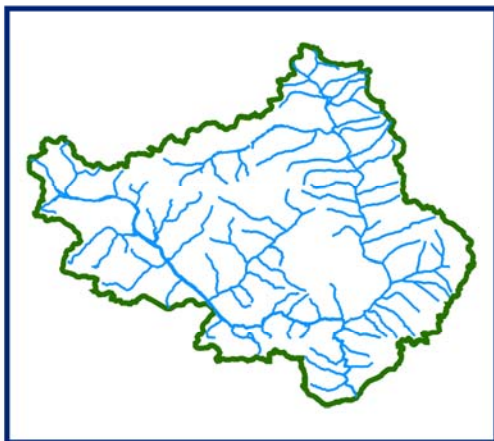
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
03 OCTOBER 2009
08 OCTOBER 2009

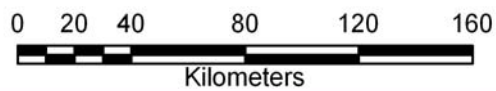


DATA USED
DATA NOT AVAILABLE

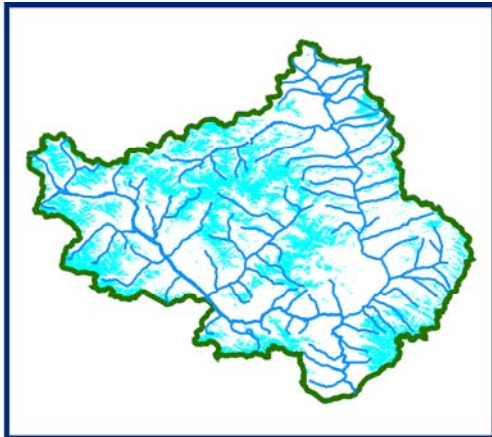


DATA USED
DATA NOT AVAILABLE

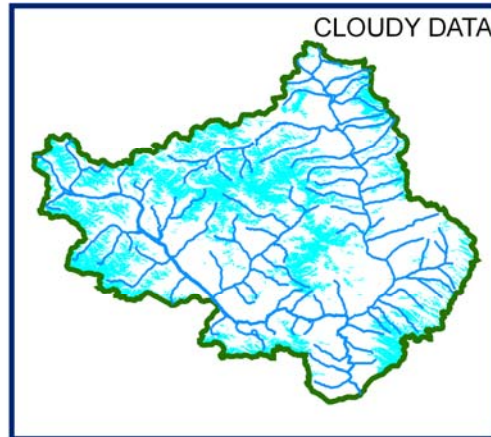
 SNOW



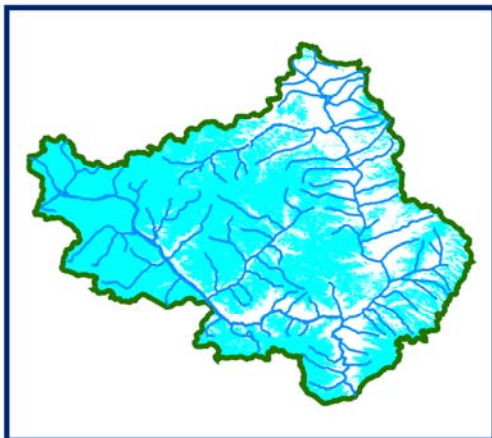
SNOW COVER MAP : SPITI BASIN



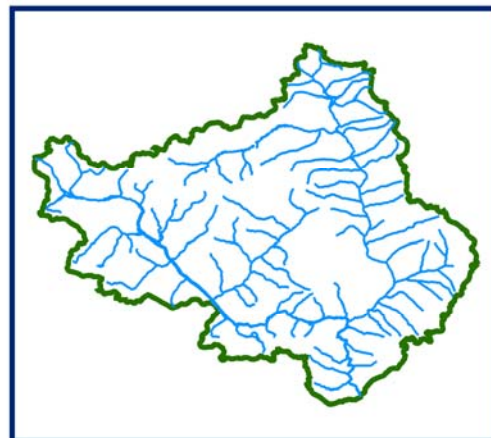
02 NOVEMBER 2009



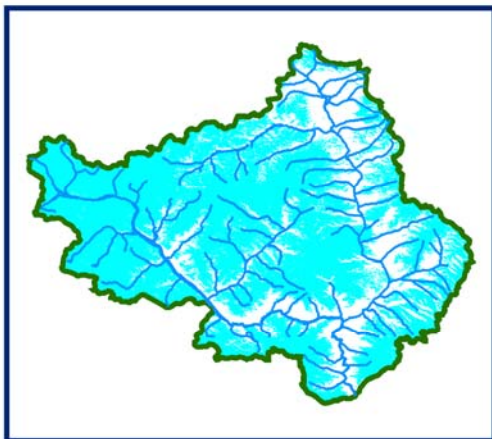
06 NOVEMBER 2009



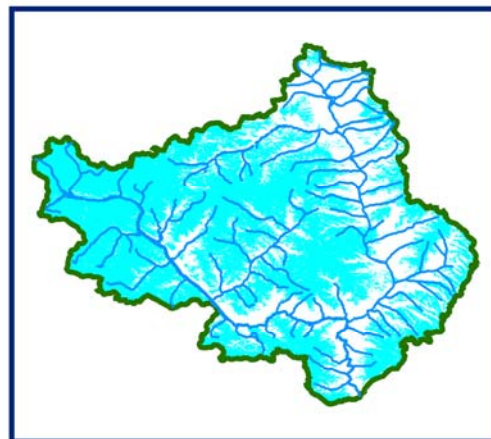
11 NOVEMBER 2009



DATA NOT AVAILABLE



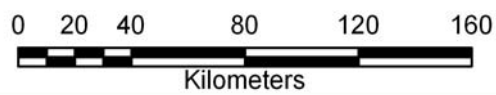
21 NOVEMBER 2009



26 NOVEMBER 2009



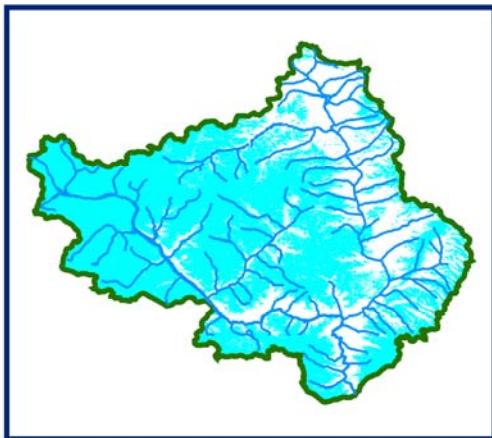
SNOW



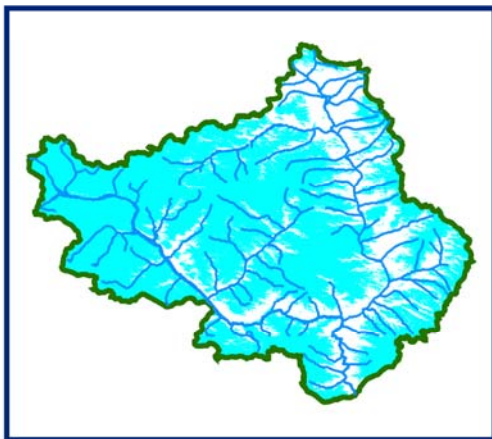
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
02 NOVEMBER 2009

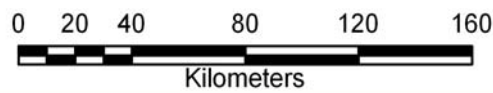


DATA USED
11 NOVEMBER 2009

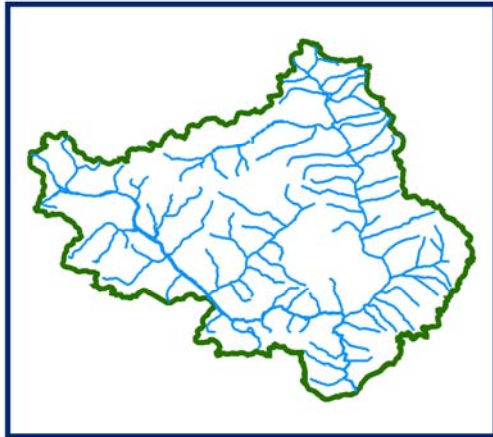


DATA USED
21 NOVEMBER 2009
25 NOVEMBER 2009
26 NOVEMBER 2009

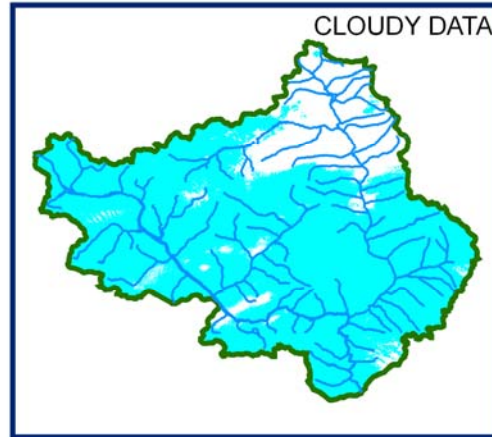
 SNOW



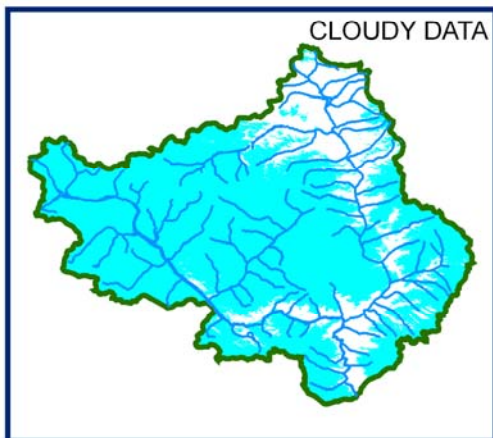
SNOW COVER MAP : SPITI BASIN



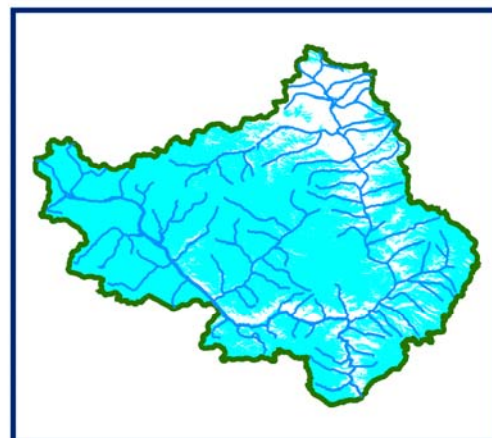
DATA NOT AVAILABLE



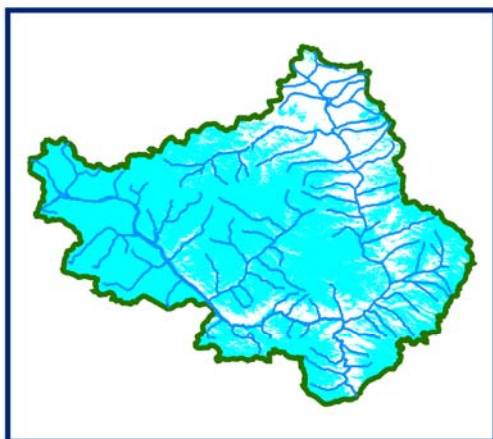
10 DECEMBER 2009



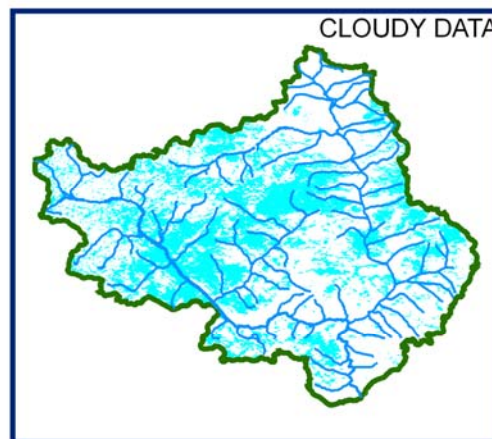
14 DECEMBER 2009



19 DECEMBER 2009



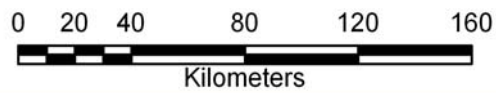
24 DECEMBER 2009



29 DECEMBER 2009



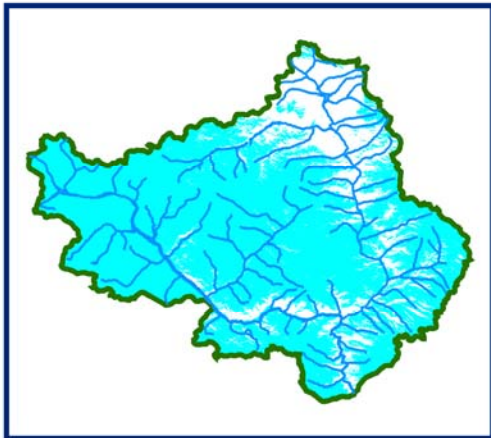
SNOW



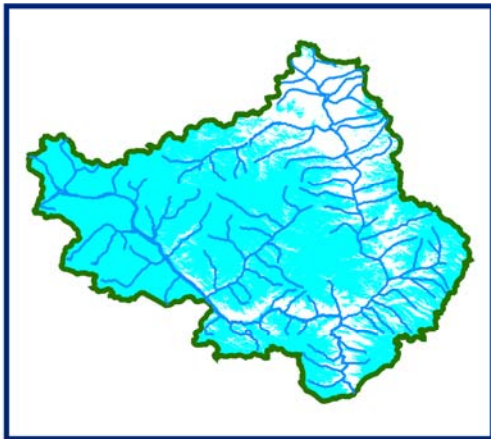
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
DATA NOT AVAILABLE



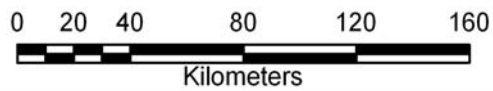
DATA USED
19 DECEMBER 2009



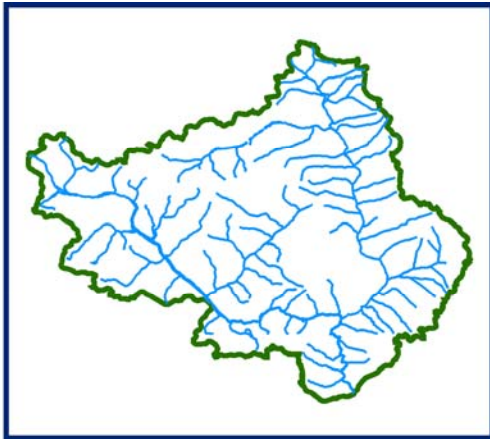
DATA USED
24 DECEMBER 2009



SNOW



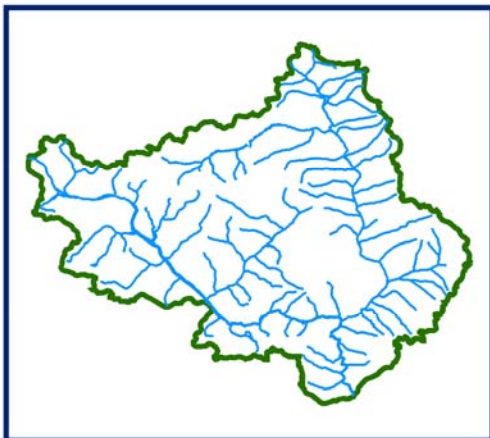
SNOW COVER MAP : SPITI BASIN



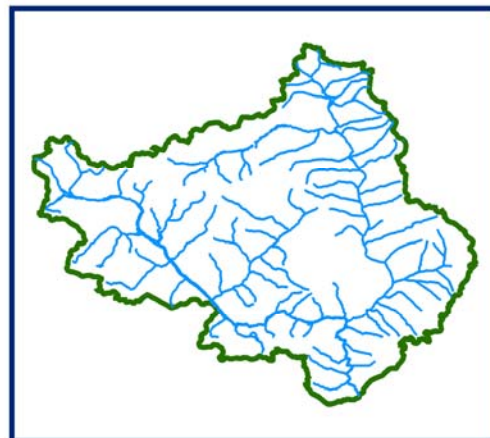
DATA NOT AVAILABLE



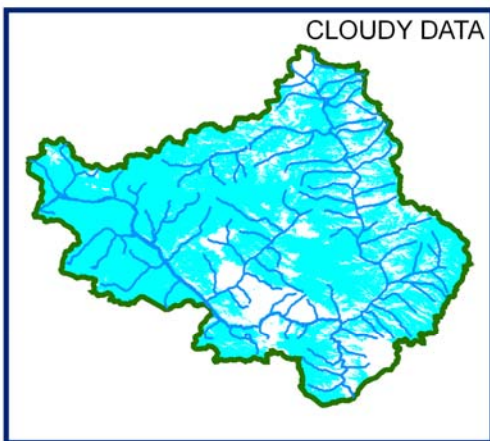
08 JANUARY 2010



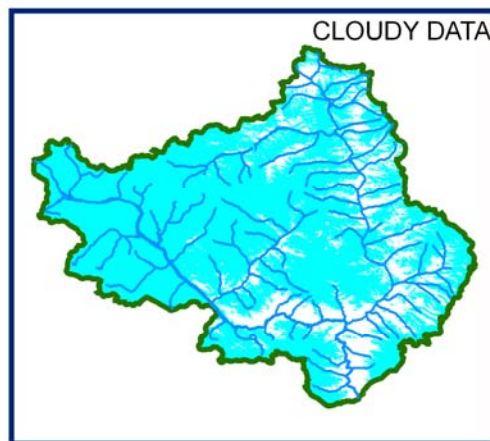
DATA NOT AVAILABLE



DATA NOT AVAILABLE



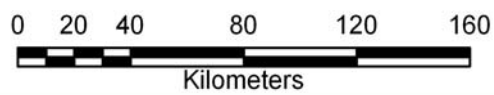
27 JANUARY 2010



31 JANUARY 2010



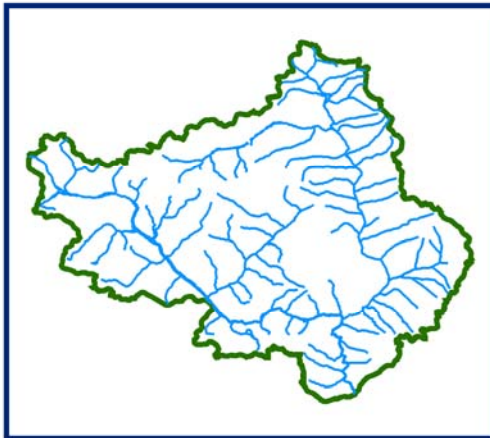
SNOW



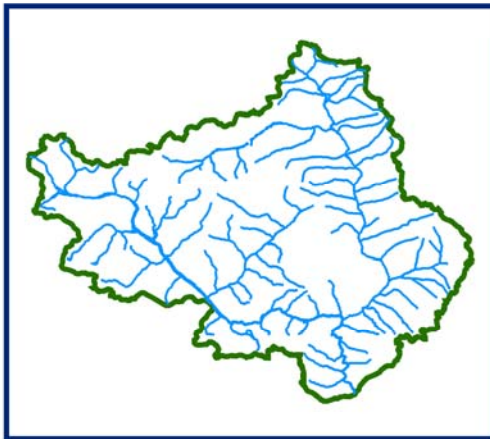
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
08 JANUARY 2010

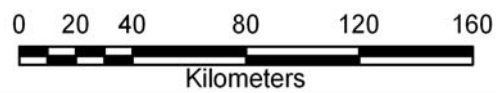


DATA USED
DATA NOT AVAILABLE

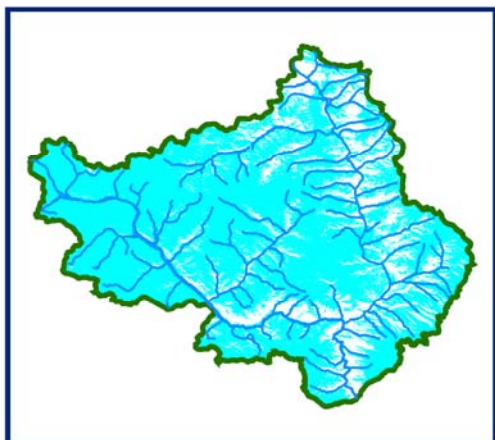


DATA USED
DATA NOT AVAILABLE

 SNOW



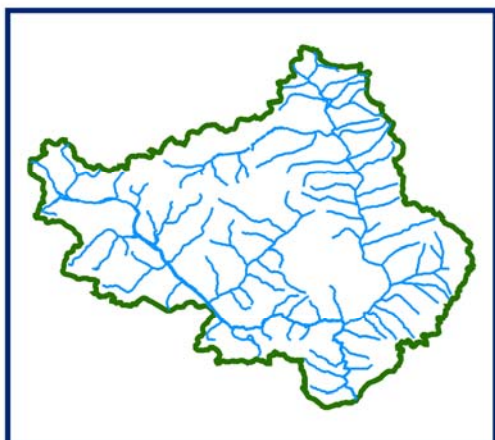
SNOW COVER MAP : SPITI BASIN



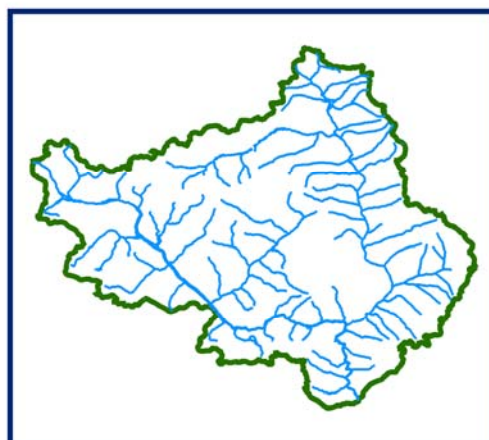
05 FEBRUARY 2010



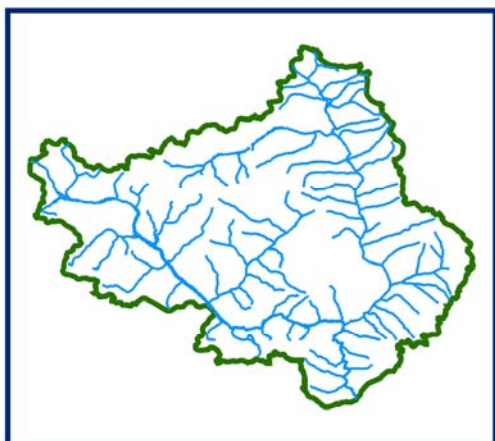
10 FEBRUARY 2010



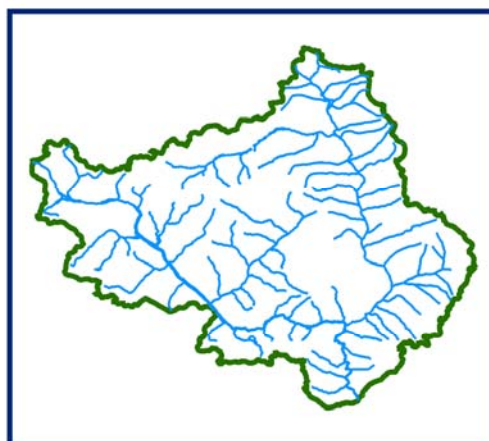
DATA NOT AVAILABLE



DATA NOT AVAILABLE

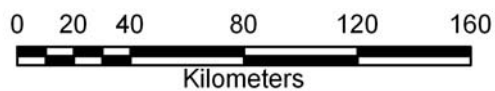


DATA NOT AVAILABLE



DATA NOT AVAILABLE

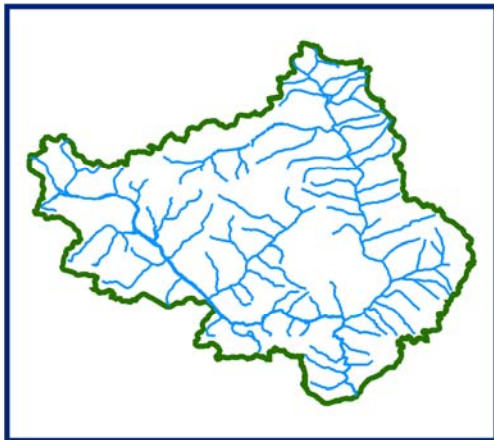
 SNOW



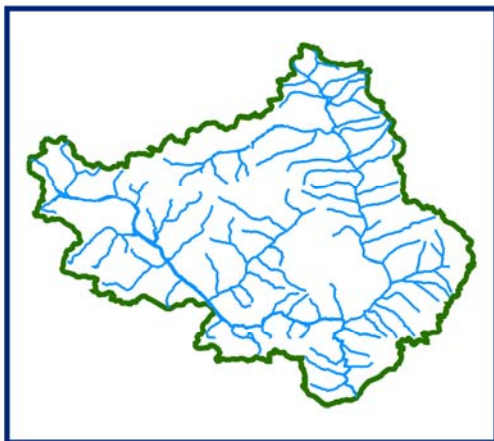
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
05 FEBRUARY 2010
10 FEBRUARY 2010

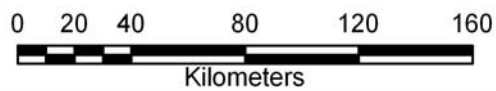


DATA USED
DATA NOT AVAILABLE



DATA USED
DATA NOT AVAILABLE

 SNOW



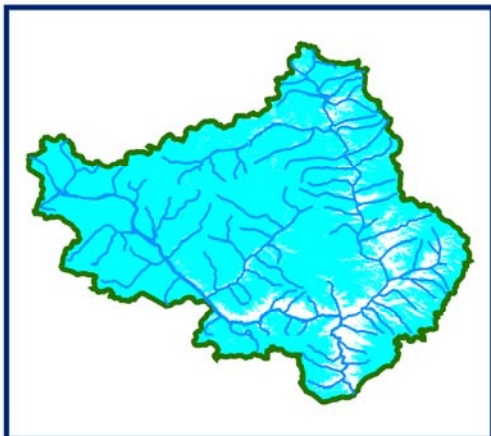
SNOW COVER MAP : SPITI BASIN



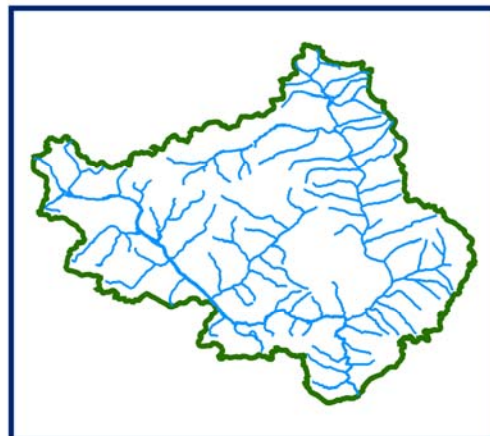
DATA NOT AVAILABLE



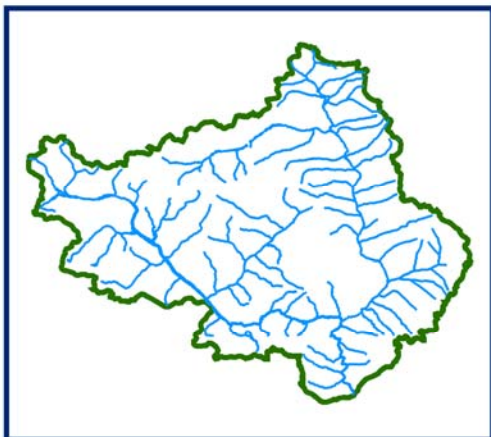
DATA NOT AVAILABLE



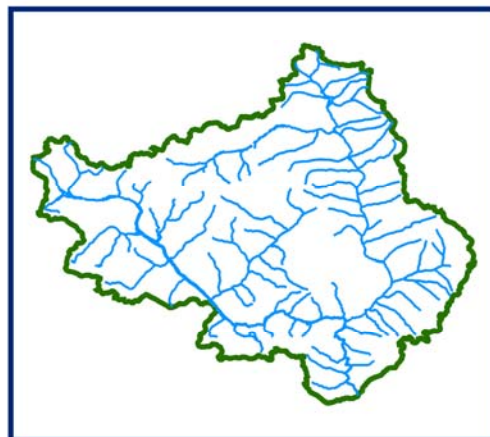
11 MARCH 2010



DATA NOT AVAILABLE

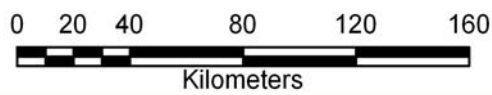


DATA NOT AVAILABLE

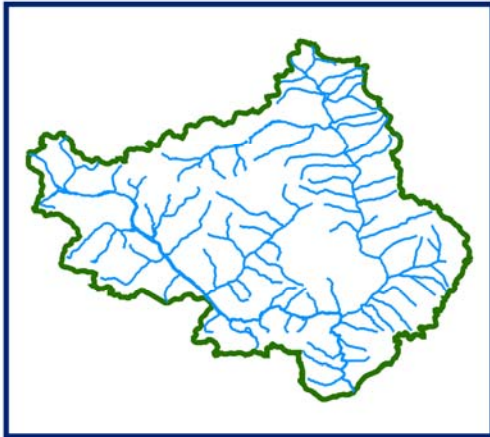


DATA NOT AVAILABLE

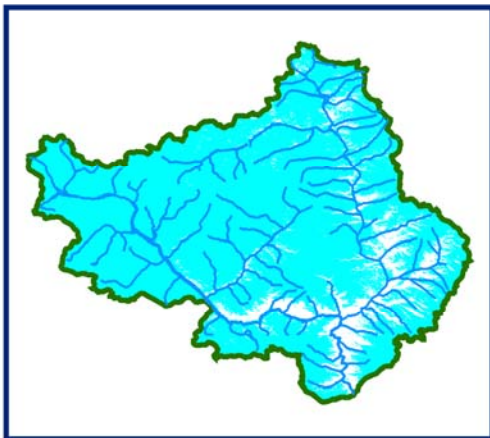
 SNOW



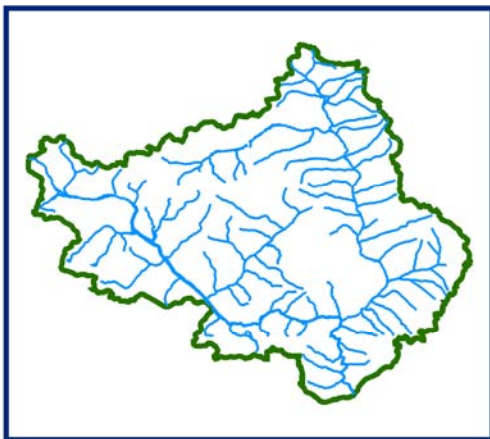
10 DAILY SNOW COVER MAP: SPITI BASIN




DATA USED
DATA NOT AVAILABLE

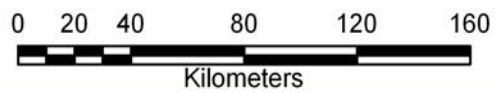


DATA USED
11 MARCH 2010

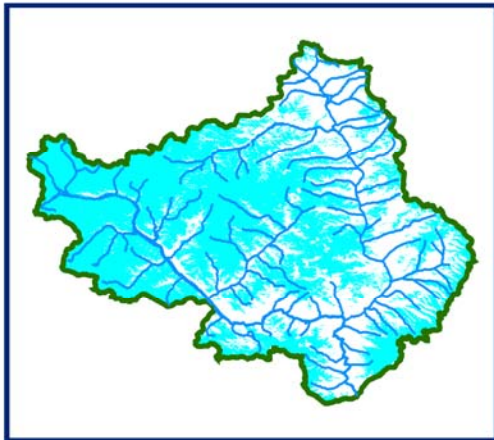


DATA USED
DATA NOT AVAILABLE

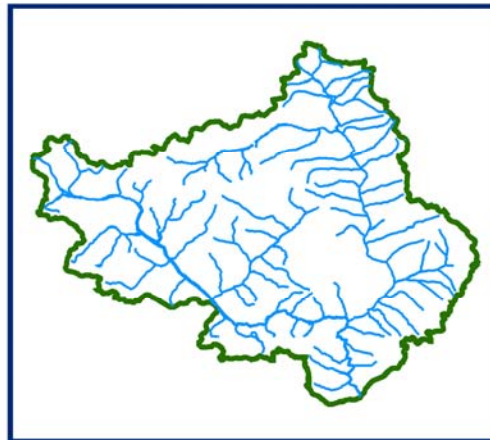
 SNOW



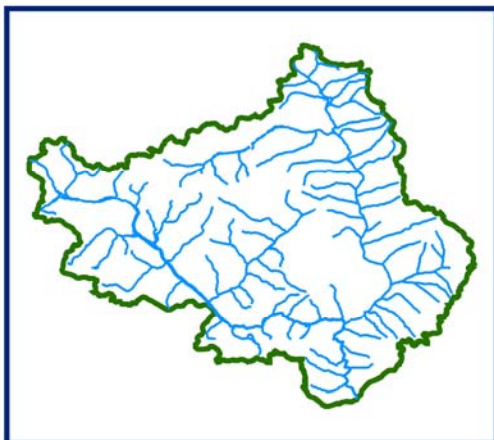
SNOW COVER MAP : SPITI BASIN



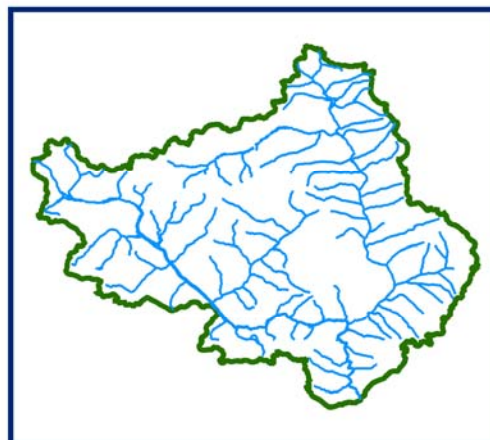
04 APRIL 2010



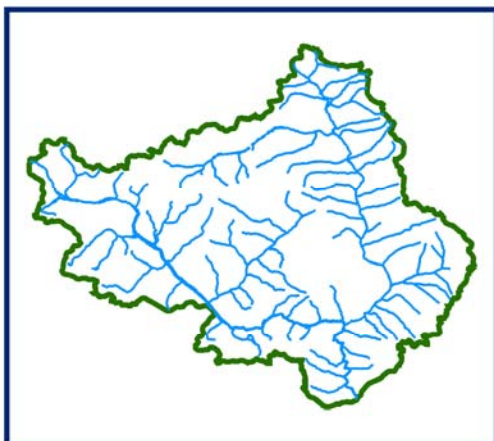
DATA NOT AVAILABLE



DATA NOT AVAILABLE



DATA NOT AVAILABLE



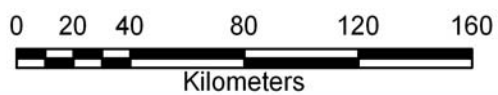
DATA NOT AVAILABLE



DATA NOT AVAILABLE



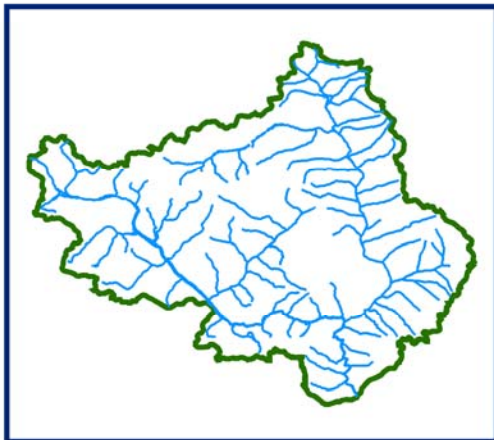
SNOW



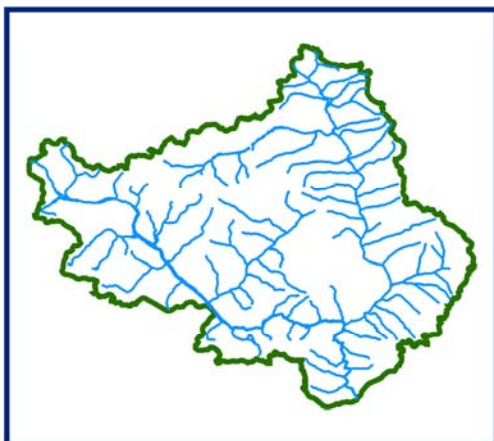
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
04 APRIL 2010

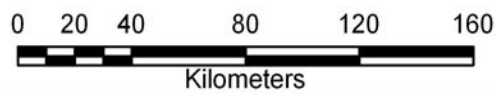


DATA USED
DATA NOT AVAILABLE

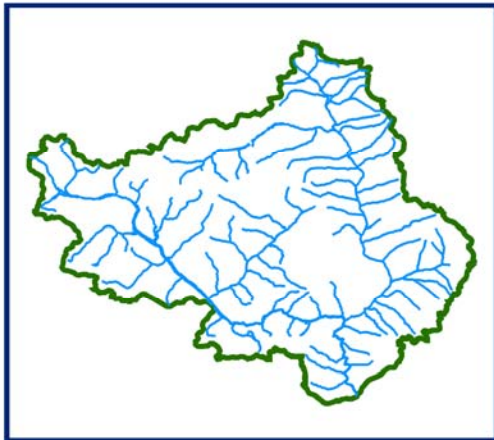


DATA USED
DATA NOT AVAILABLE

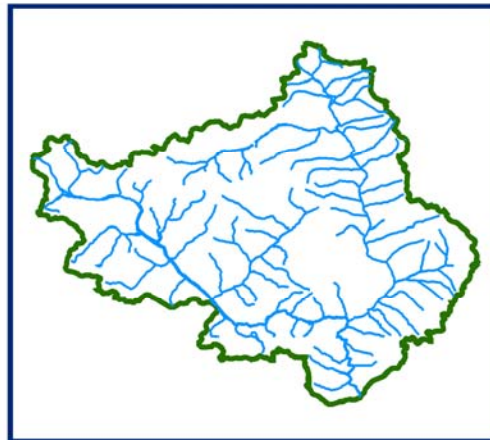
 SNOW



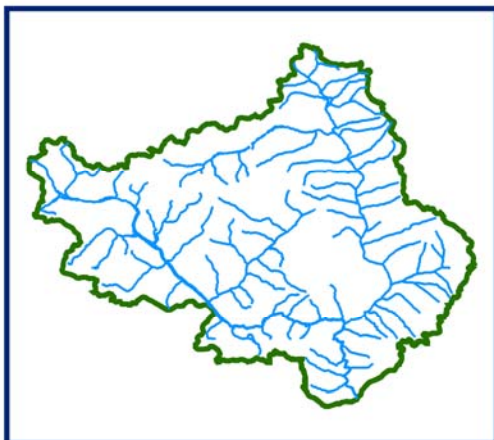
SNOW COVER MAP : SPITI BASIN



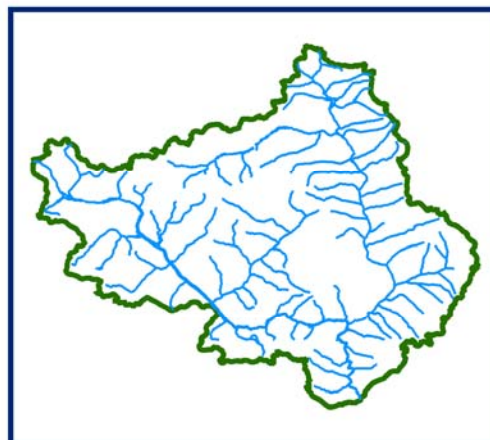
DATA NOT AVAILABLE



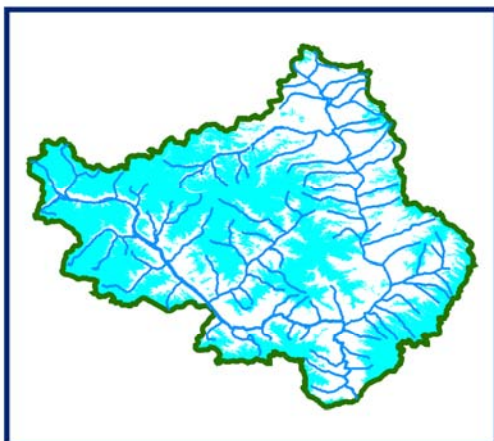
DATA NOT AVAILABLE



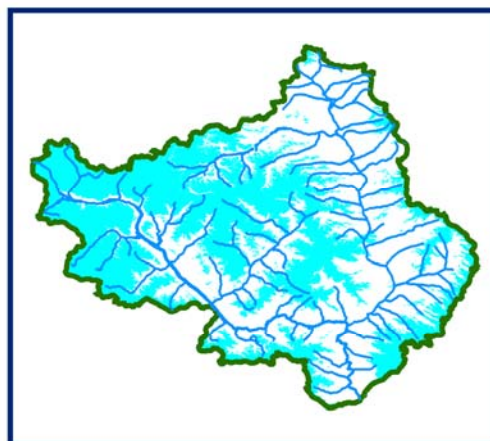
DATA NOT AVAILABLE



DATA NOT AVAILABLE



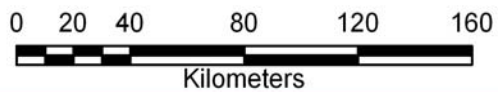
22 MAY 2010



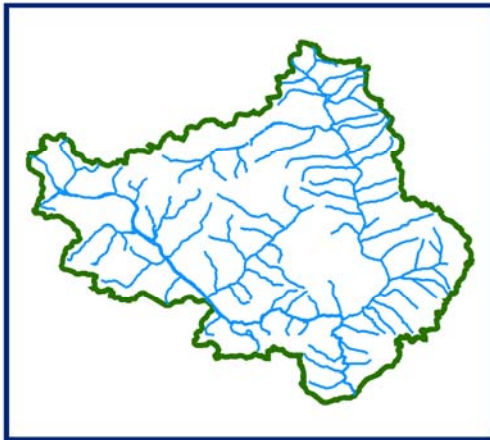
31 MAY 2010



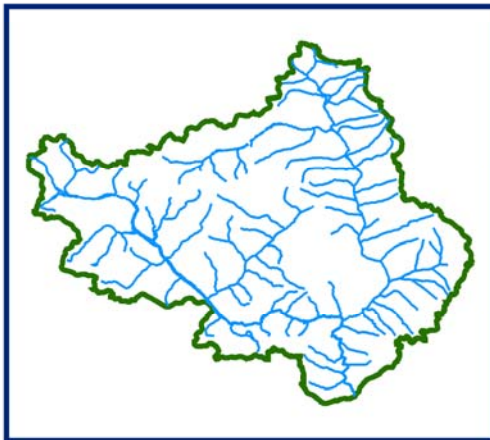
SNOW



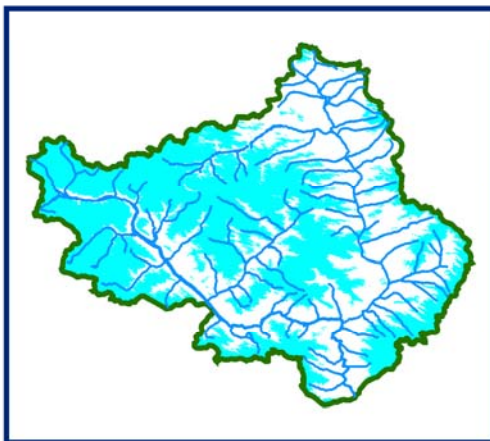
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
DATA NOT AVAILABLE

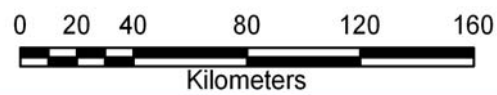


DATA USED
DATA NOT AVAILABLE

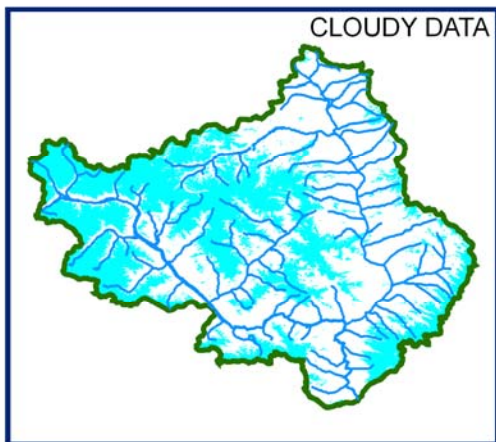


DATA USED
22 MAY 2010
31 MAY 2010

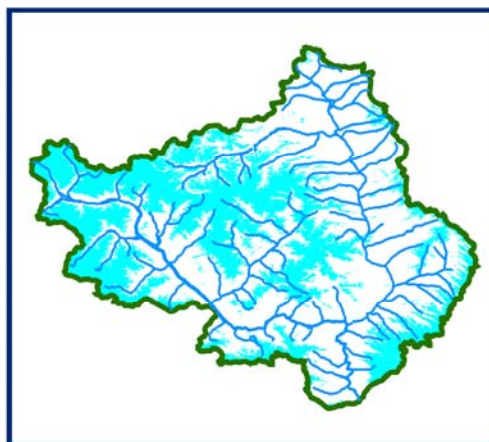
 SNOW



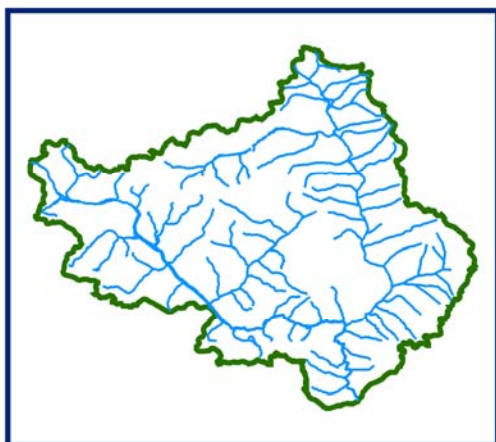
SNOW COVER MAP : SPITI BASIN



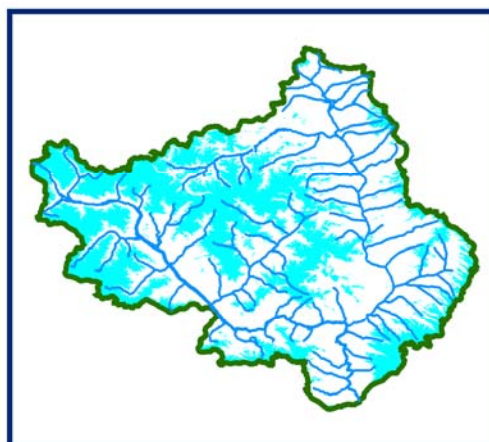
01 JUNE 2010



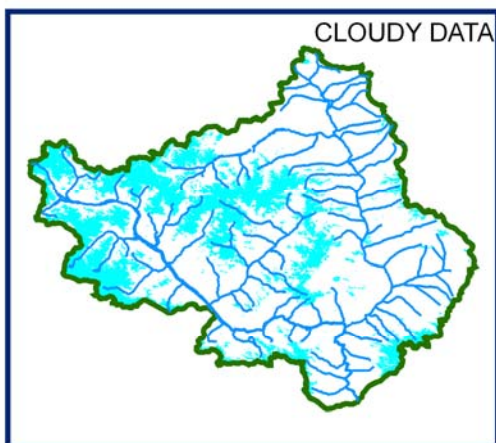
06 JUNE 2010



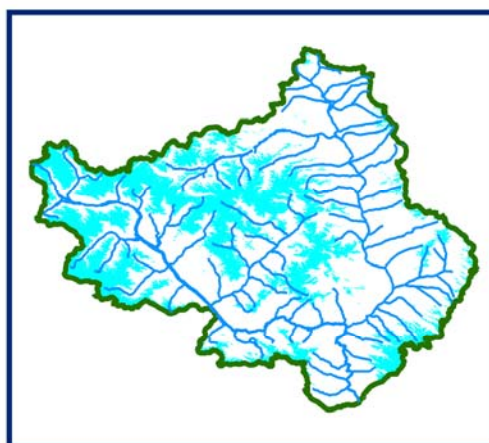
DATA NOT AVAILABLE



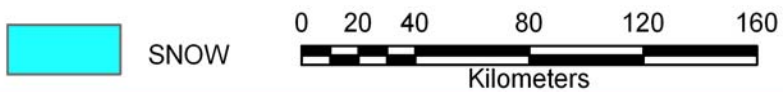
20 JUNE 2010



24 JUNE 2010



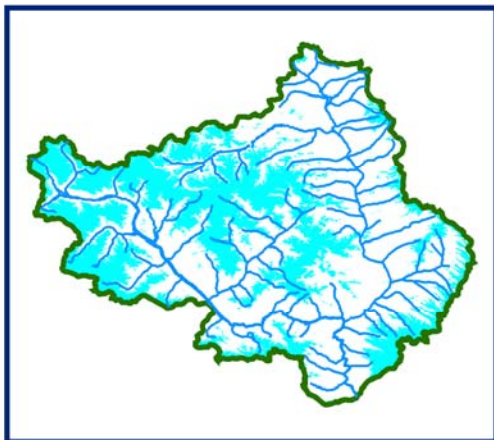
29 JUNE 2010



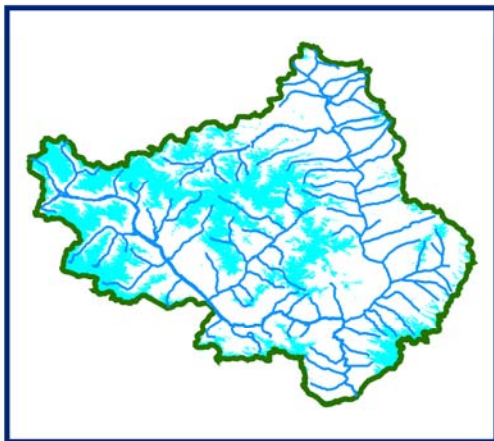
10 DAILY SNOW COVER MAP: SPITI BASIN



DATA USED
06 JUNE 2010

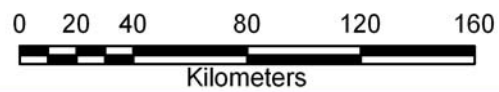


DATA USED
20 JUNE 2010



DATA USED
29 JUNE 2010

 SNOW



BASPA BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: BASPA

BASIN AREA: 1095 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009							
1	3-Oct-09	431.9	39	2	4-Oct-09	420.1	38
3	8-Oct-09	603.7	55	4	18-Oct-09	855.4	78
5	27-Oct-09	495.5	45	6	28-Oct-09	511.6	47
November 2009							
7	1-Nov-09	534.5	49	8	6-Nov-09	512.0	47
9	11-Nov-09	1051.7	96	10	16-Nov-09	1001.9	91
11	20-Nov-09	936.5	86	12	21-Nov-09	900.1	82
13	25-Nov-09	868.6	79	14	30-Nov-09	823.1	75
December 2009							
15	10-Dec-09	753.8	69	16	14-Dec-09	974.3	89
17	19-Dec-09	1003.7	92	18	24-Dec-09	968.0	88
19	29-Dec-09	526.0	48				
January 2010							
20	8-Jan-10	956.3	87	21	27-Jan-10	692.0	63
22	31-Jan-10	836.9	76				
February 2010							
23	5-Feb-10	913.9	83	24	10-Feb-10	1095.0	100
March 2010							
25	6-Mar-10	1023.6	93				
April 2010							
26	4-Apr-10	952.6	87				
May 2010							
27	8-May-10	419.8	38	28	22-May-10	689.2	63
29	31-May-10	654.0	60				
June 2010							
30	5-Jun-10	613.2	56	31	20-Jun-10	509.1	46
32	24-Jun-10	399.5	36	33	29-Jun-10	445.9	41
July 2010							
34	14-Jul-10	417.8	38				

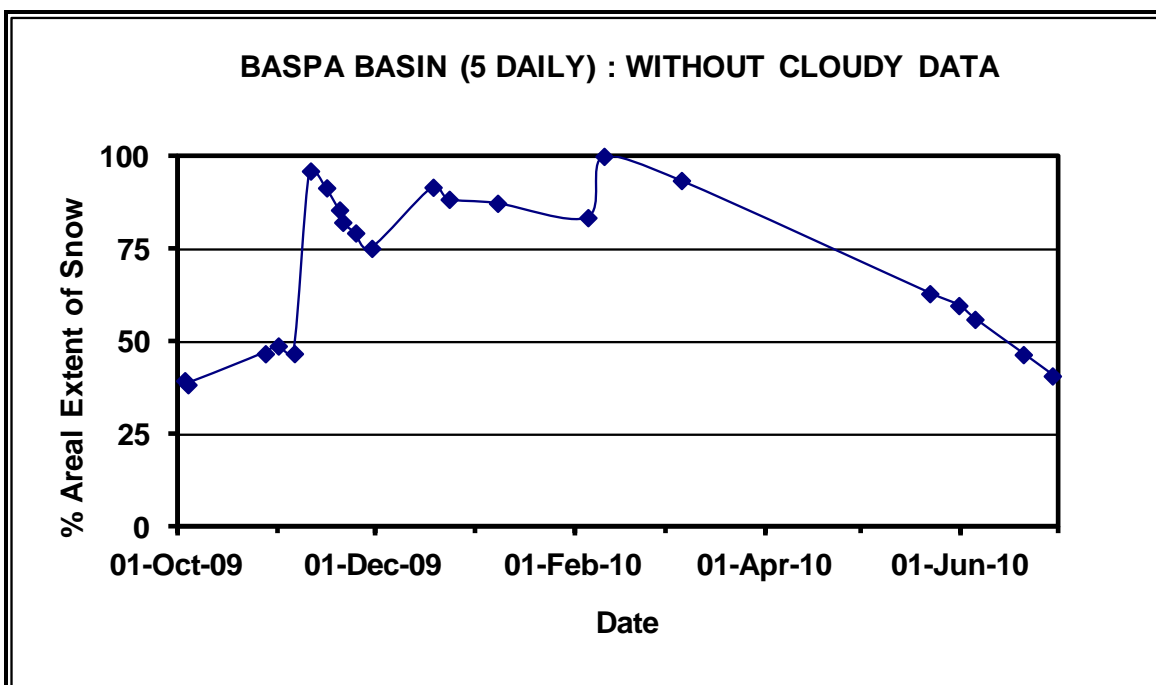
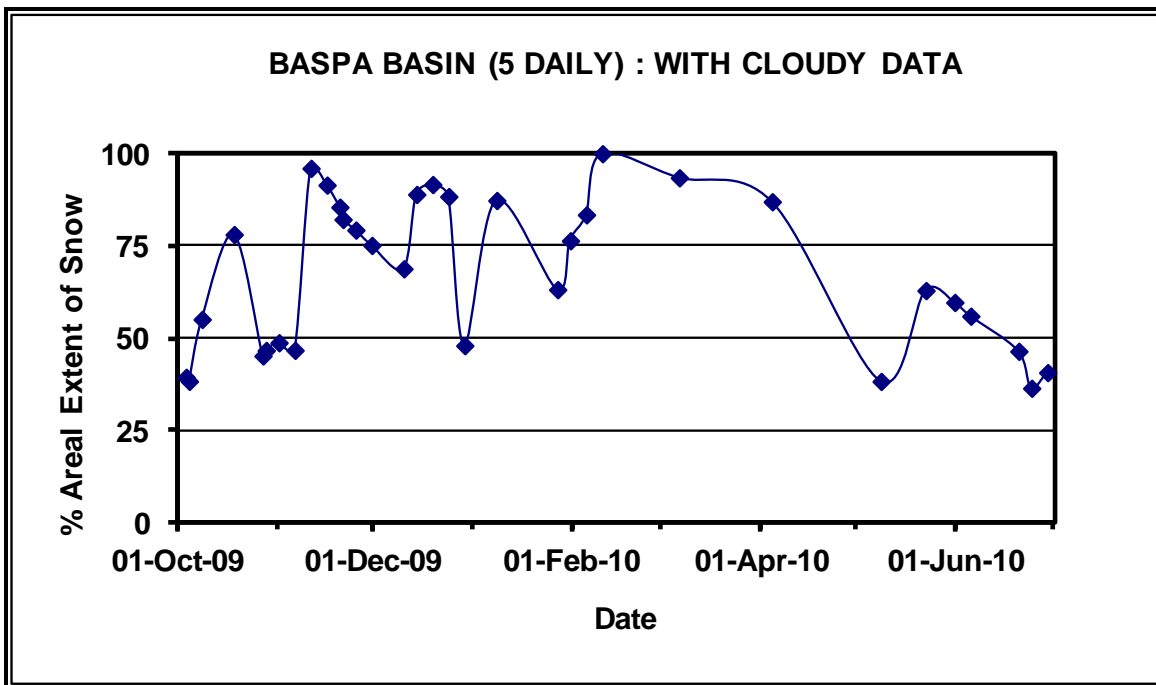
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: BASPA

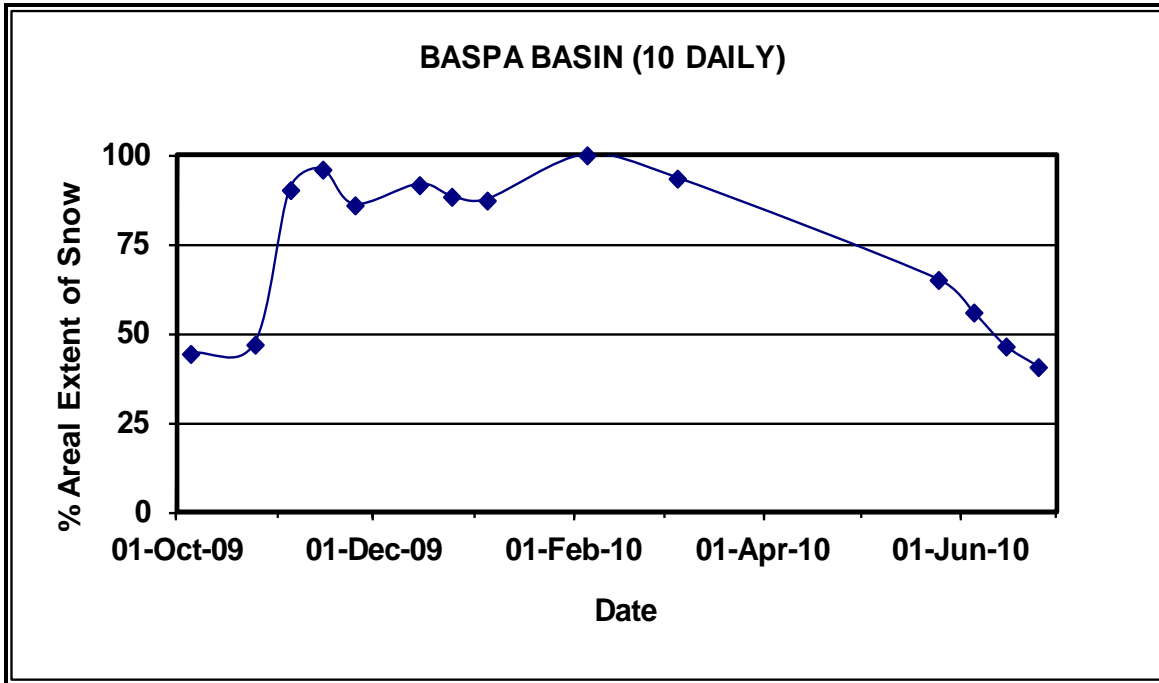
BASIN AREA: 1095 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009				November 2009			
1	3-Oct-09	486.3	44	3	1-Nov-09	988.5	90
2	28-Oct-09	504.7	46	4	16-Nov-09	988.5	90
				5	25-Nov-09	887.4	81
December 2009				January 2010			
6	19-Dec-09	1003.7	92	8	8-Jan-10	956.3	87
7	24-Dec-09	968.0	88				
February 2010				March 2010			
9	5-Feb-10	1095.0	100	10	6-Mar-10	1023.6	93
April 2010				May 2010			
				11	22-May-10	713.0	65
June 2010				July 2010			
12	5-Jun-10	613.2	56	15	14-Jul-10	417.8	38
13	20-Jun-10	509.1	46				
14	29-Jun-10	445.9	41				

Snow cover depletion curve

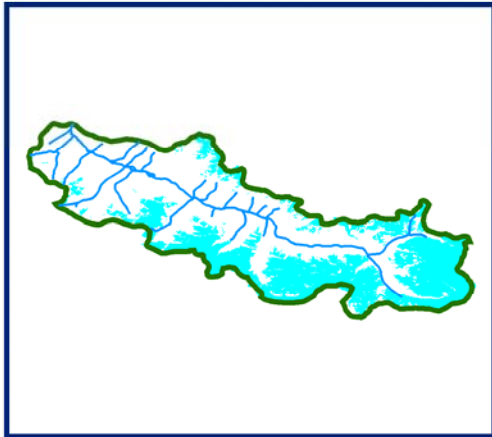


Snow cover depletion curve

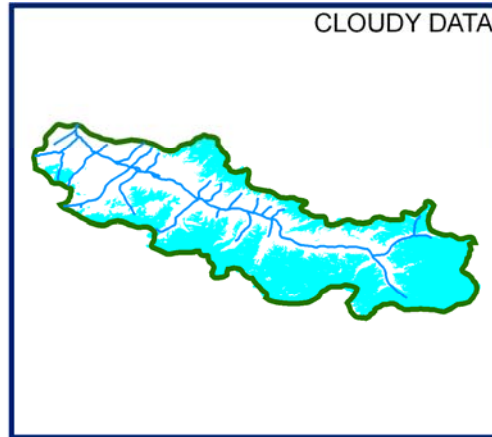


SNOW COVER MAP

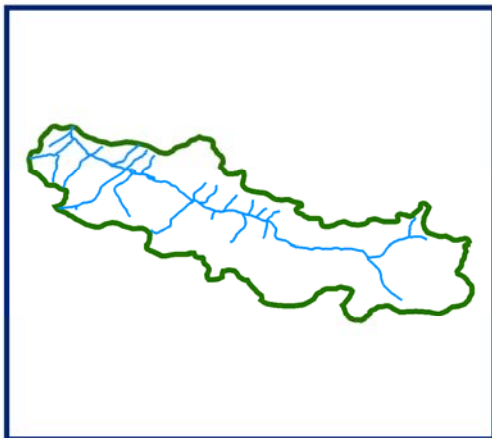
SNOW COVER MAP : BASPA BASIN



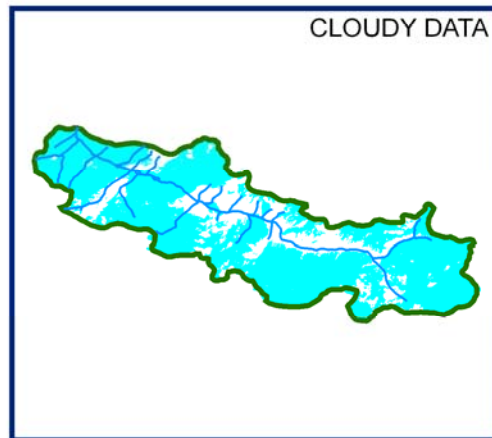
03 OCTOBER 2009



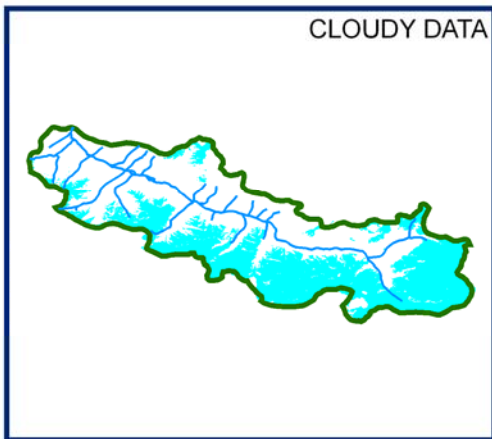
08 OCTOBER 2009



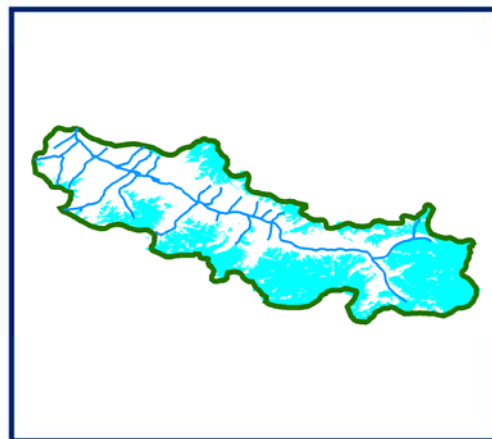
DATA NOT AVAILABLE



18 OCTOBER 2009

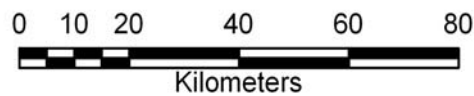


27 OCTOBER 2009

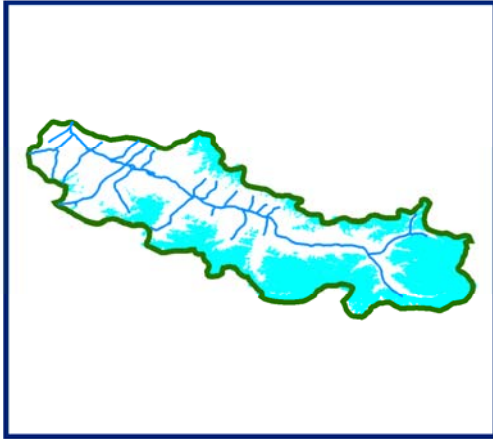


28 OCTOBER 2009

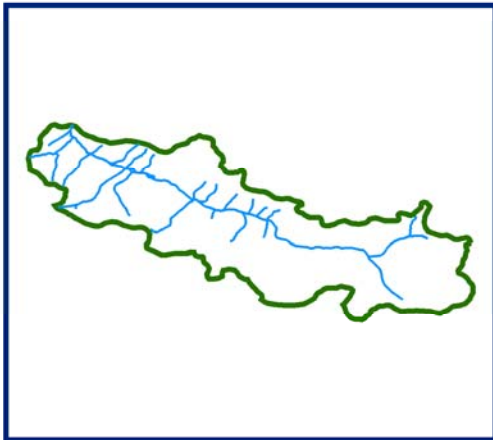
 SNOW



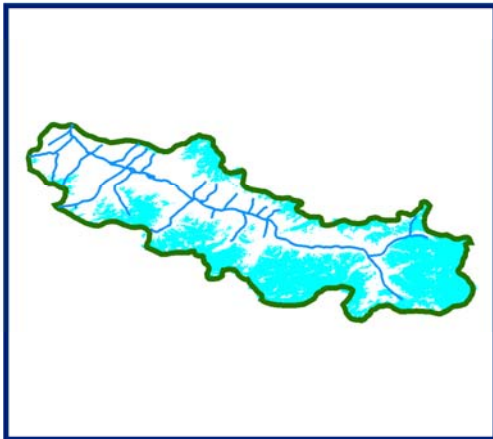
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
03 OCTOBER 2009
04 OCTOBER 2009

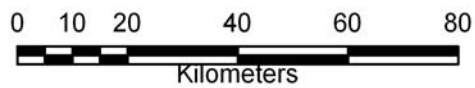


DATA USED
DATA NOT AVAILABLE

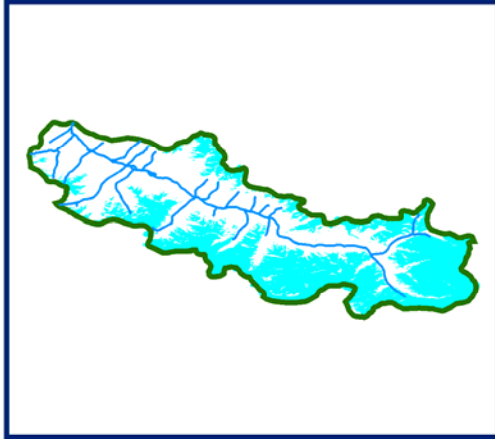


DATA USED
28 OCTOBER 2009

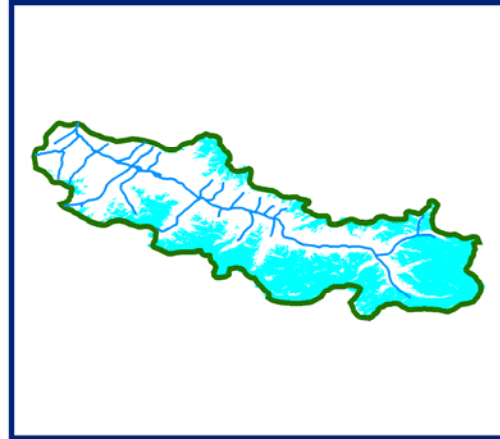
 SNOW



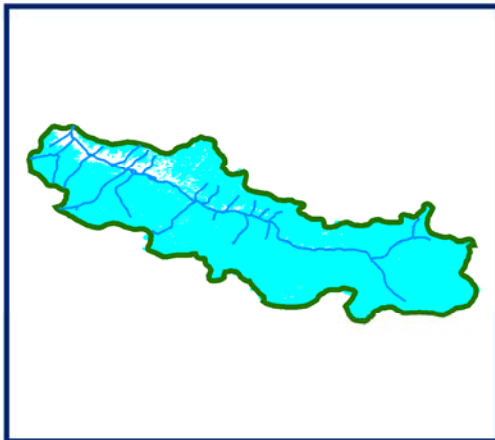
SNOW COVER MAP : BASPA BASIN



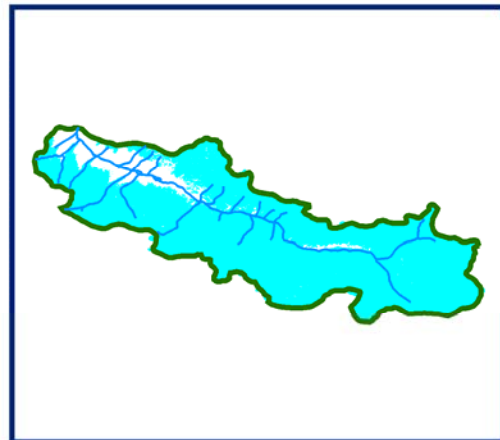
01 NOVEMBER 2009



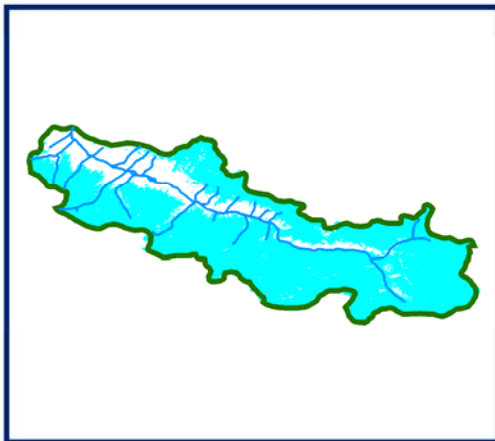
06 NOVEMBER 2009



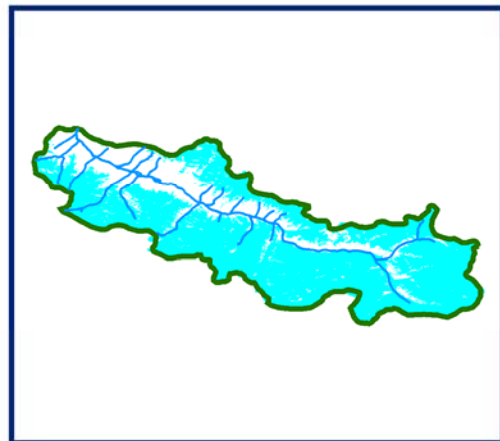
11 NOVEMBER 2009



16 NOVEMBER 2009

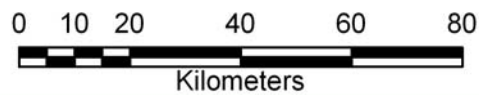


21 NOVEMBER 2009

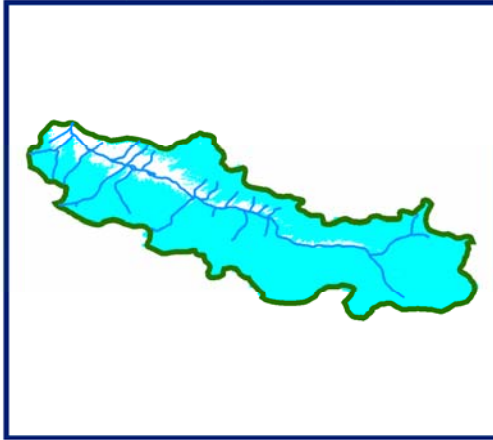


30 NOVEMBER 2009

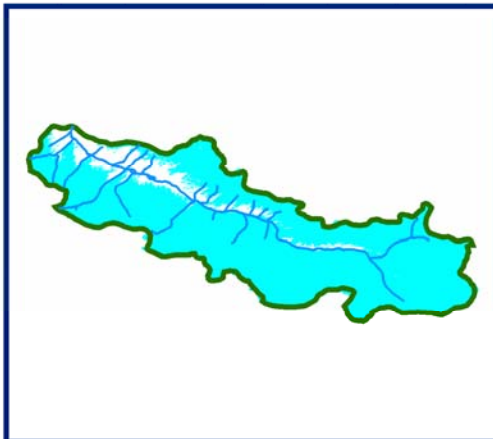
 SNOW



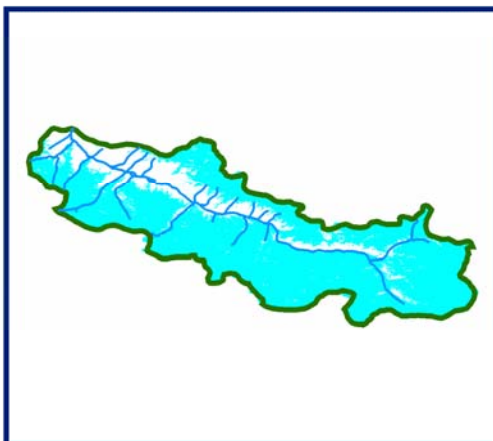
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
01 NOVEMBER 2009
06 NOVEMBER 2009

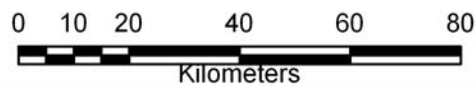


DATA USED
11 NOVEMBER 2009
16 NOVEMBER 2009
20 NOVEMBER 2009

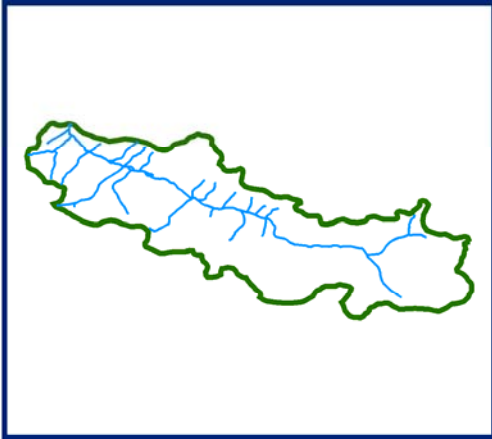


DATA USED
21 NOVEMBER 2009
25 NOVEMBER 2009
30 NOVEMBER 2009

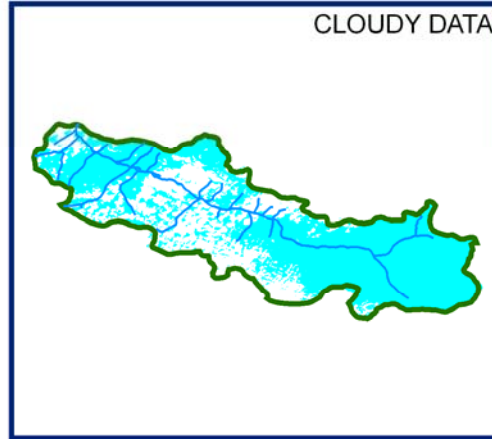
 SNOW



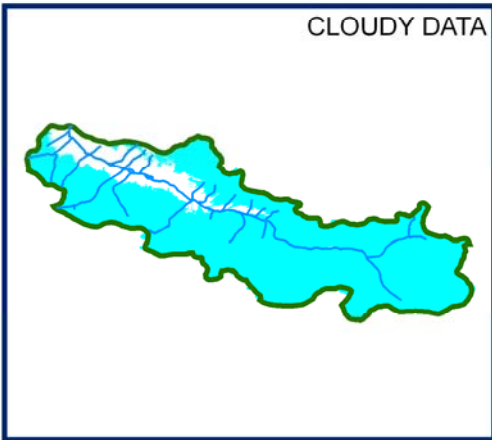
SNOW COVER MAP : BASPA BASIN



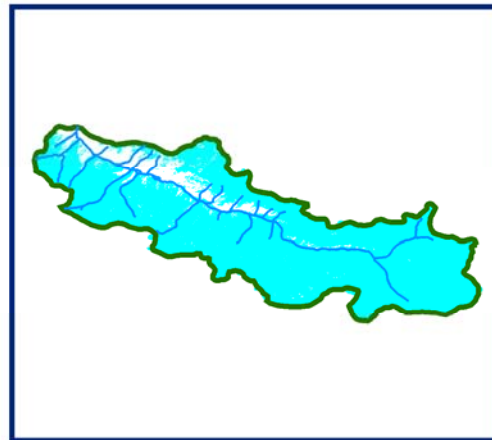
DATA NOT AVAILABLE



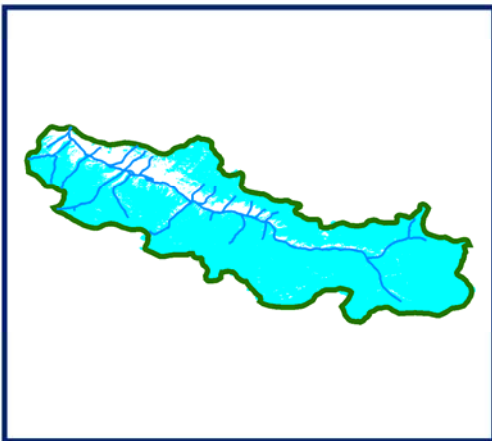
10 DECEMBER 2009



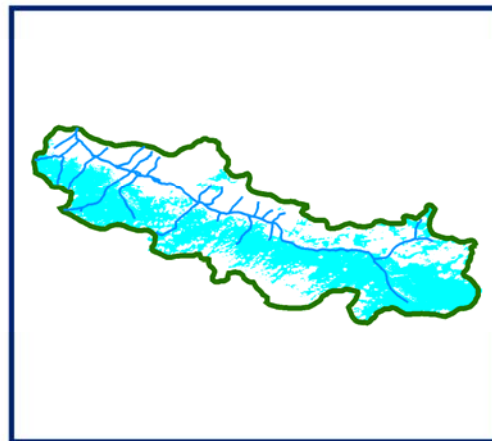
14 DECEMBER 2009



19 DECEMBER 2009

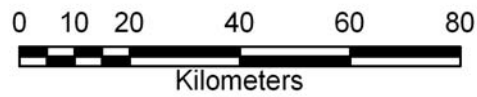


24 DECEMBER 2009

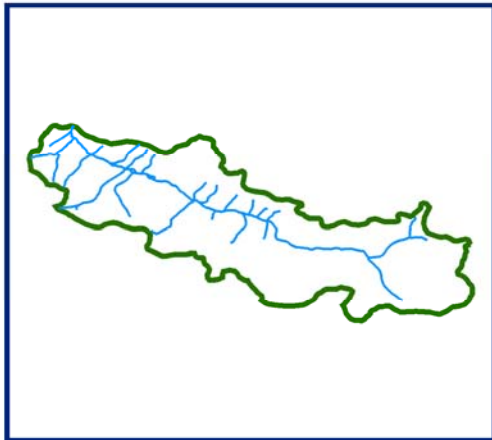


29 DECEMBER 2009

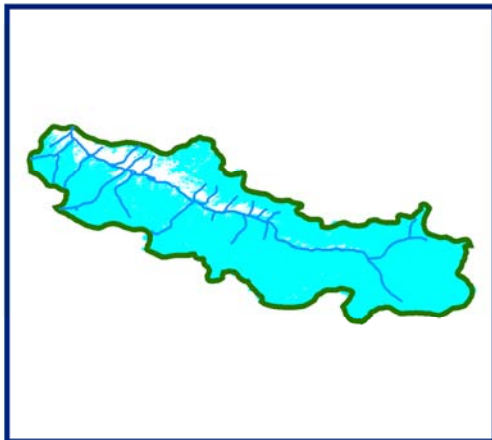
 SNOW



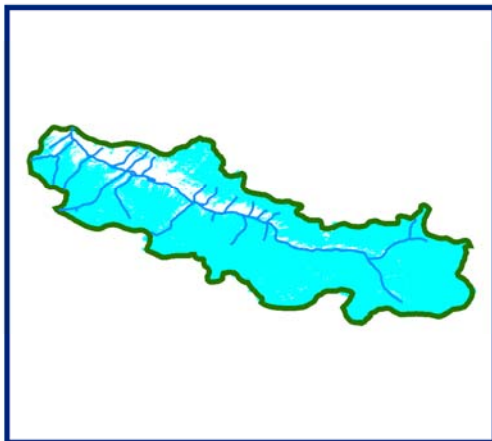
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
DATA NOT AVAILABLE

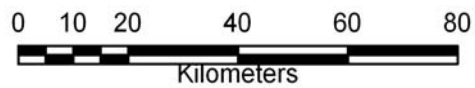


DATA USED
19 DECEMBER 2009

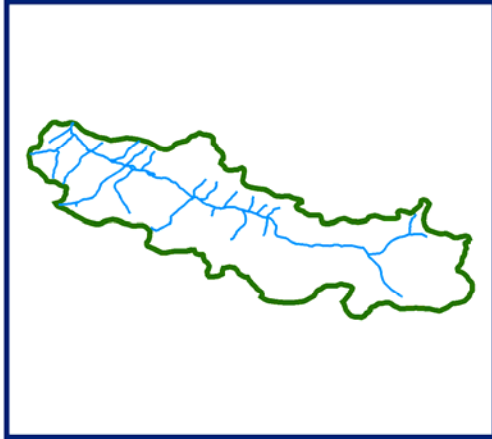


DATA USED
24 DECEMBER 2009

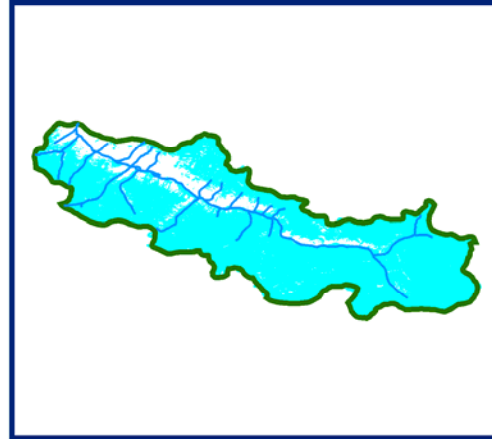
 SNOW



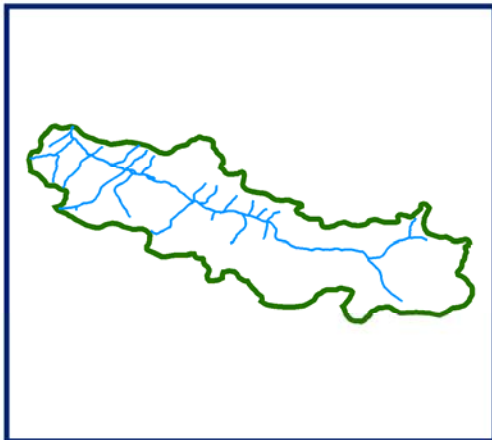
SNOW COVER MAP : BASPA BASIN



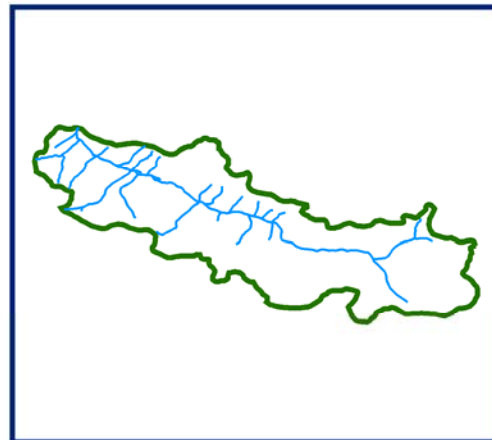
DATA NOT AVAILABLE



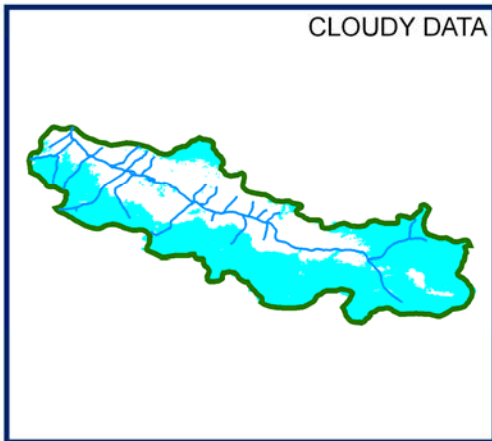
08 JANUARY 2010



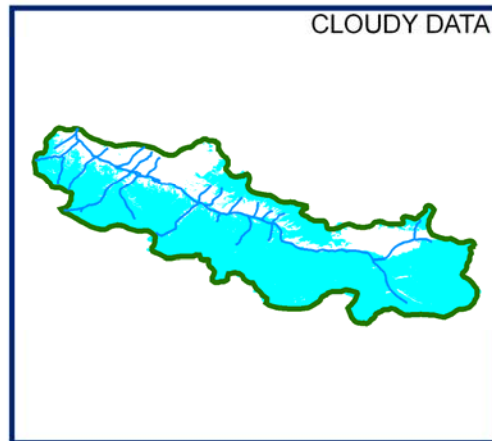
DATA NOT AVAILABLE



DATA NOT AVAILABLE

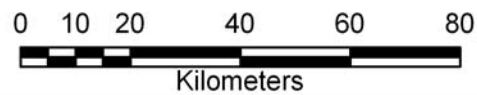


27 JANUARY 2010

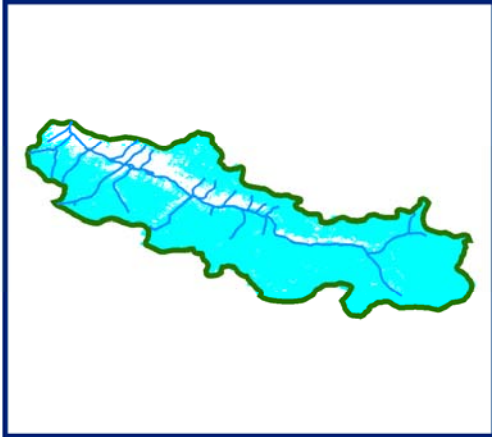


31 JANUARY 2010

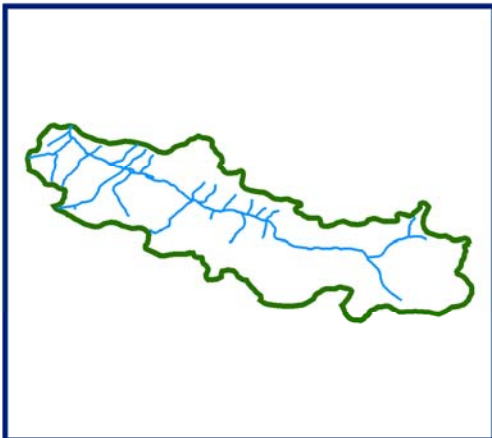
 SNOW



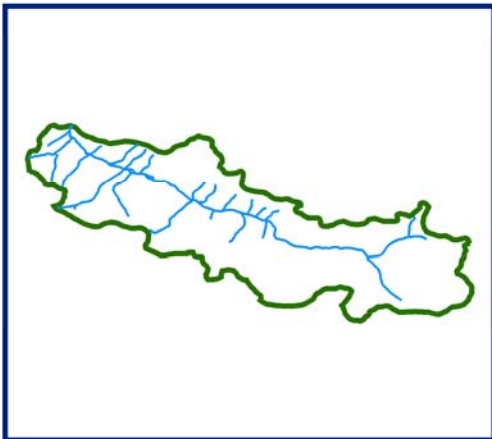
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
08 JANUARY 2010

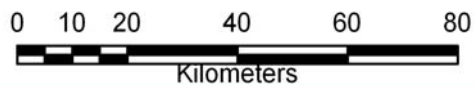


DATA USED
DATA NOT AVAILABLE

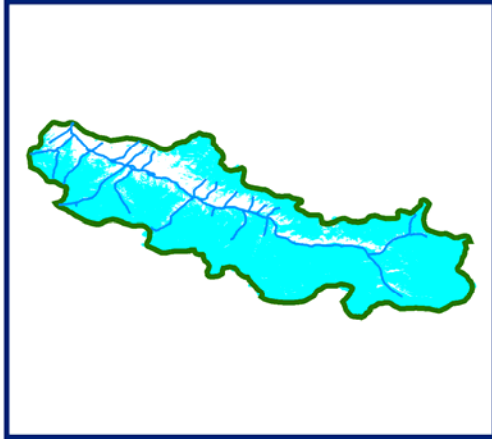


DATA USED
DATA NOT AVAILABLE

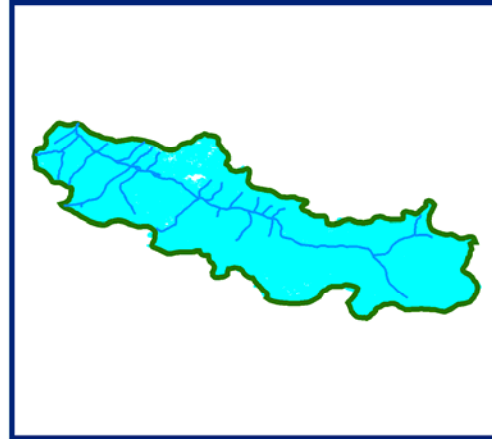
 SNOW



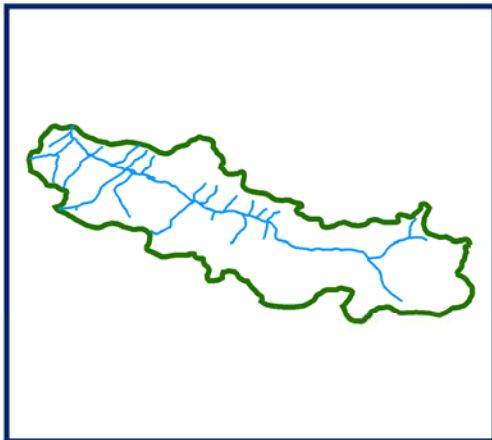
SNOW COVER MAP : BASPA BASIN



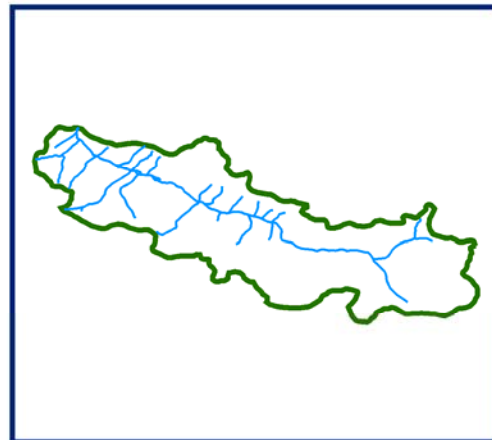
05 FEBRUARY 2010



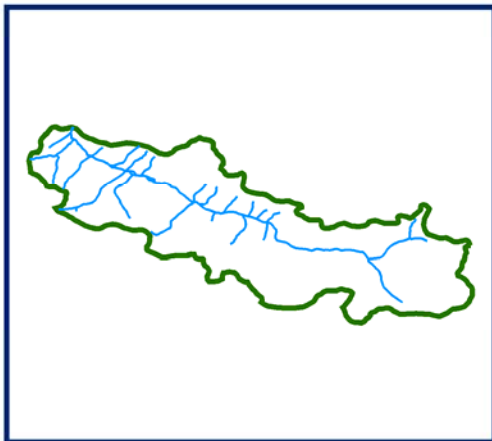
10 FEBRUARY 2010



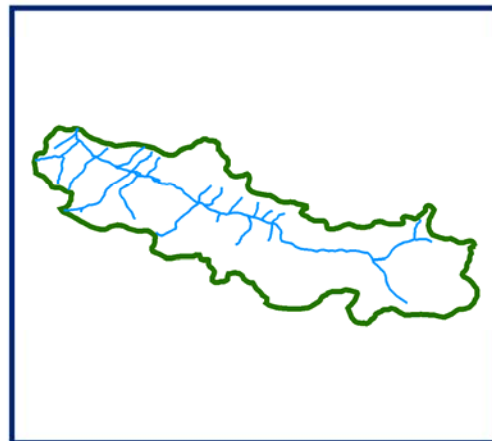
DATA NOT AVAILABLE



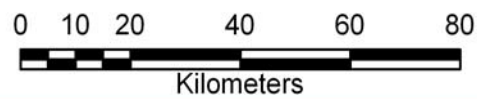
DATA NOT AVAILABLE



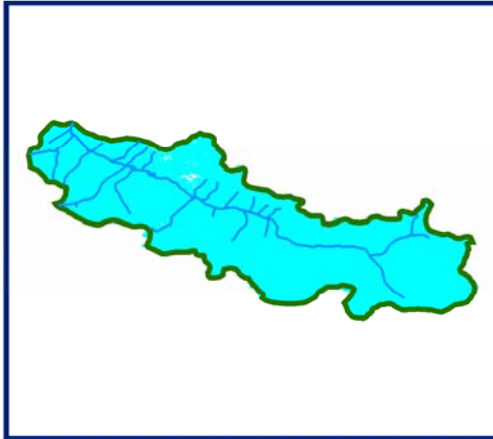
DATA NOT AVAILABLE



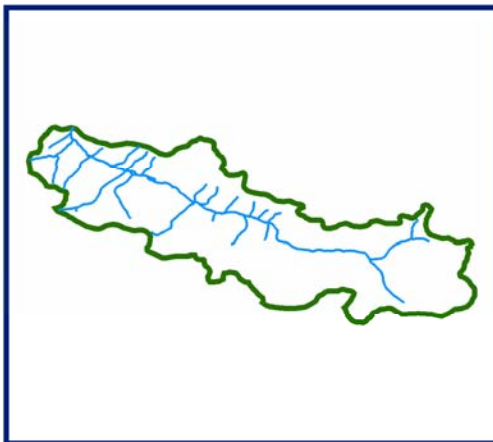
DATA NOT AVAILABLE



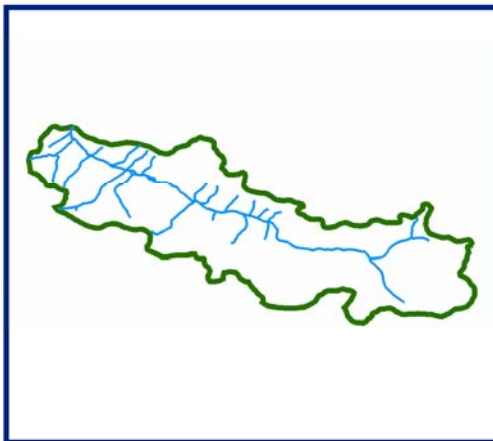
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
05 FEBRUARY 2010
10 FEBRUARY 2010

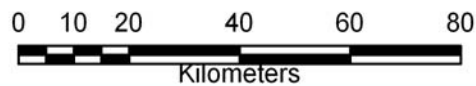


DATA USED
DATA NOT AVAILABLE

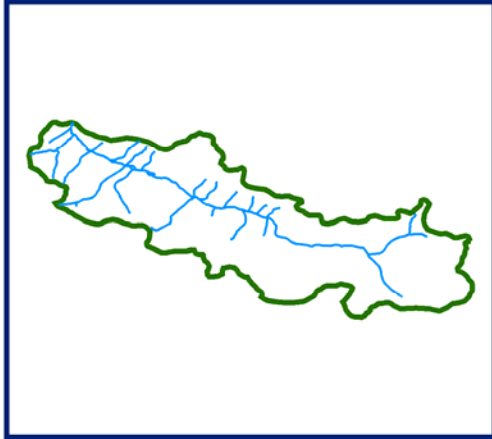


DATA USED
DATA NOT AVAILABLE

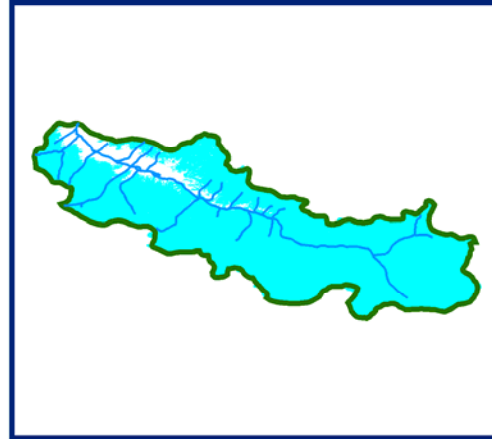
 SNOW



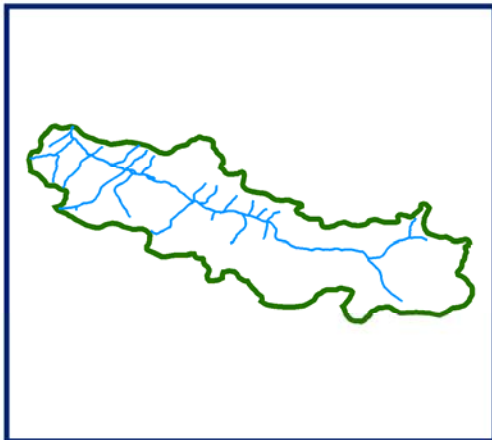
SNOW COVER MAP : BASPA BASIN



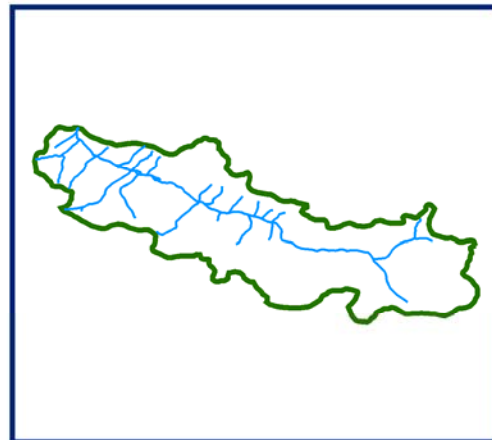
DATA NOT AVAILABLE



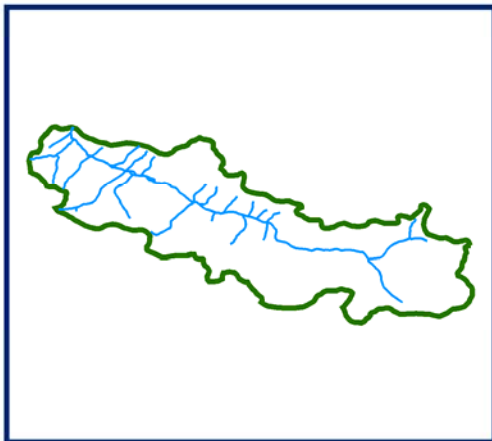
06 MARCH 2010



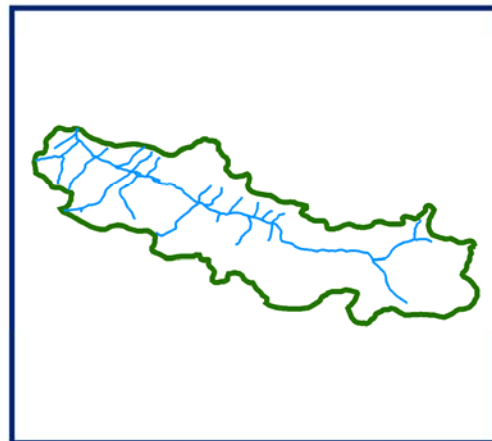
DATA NOT AVAILABLE



DATA NOT AVAILABLE

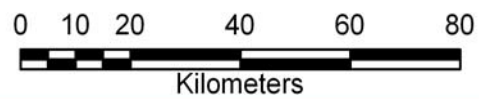


DATA NOT AVAILABLE



DATA NOT AVAILABLE

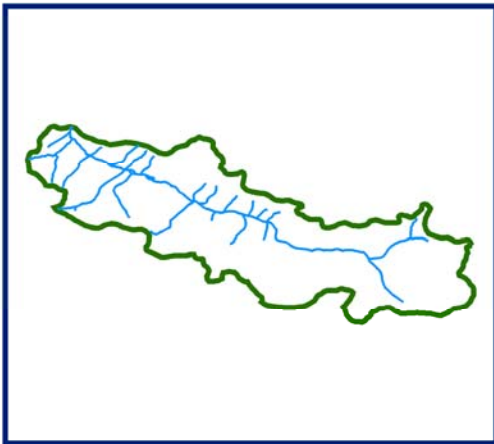
 SNOW



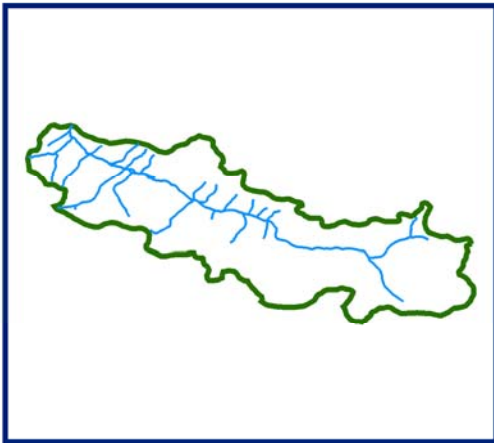
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
06 MARCH 2010

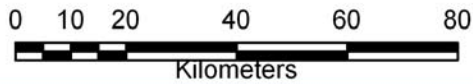


DATA USED
DATA NOT AVAILABLE

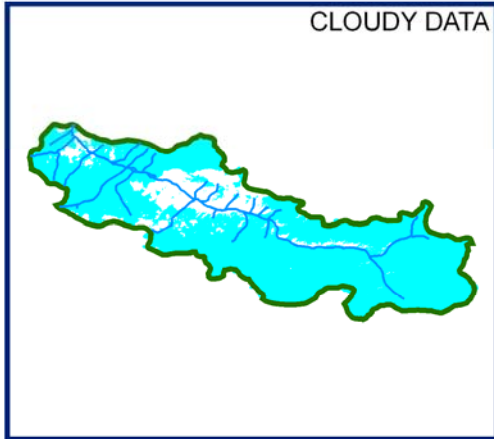


DATA USED
DATA NOT AVAILABLE

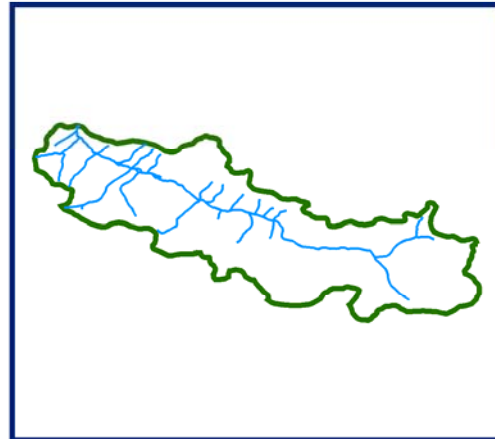
 SNOW



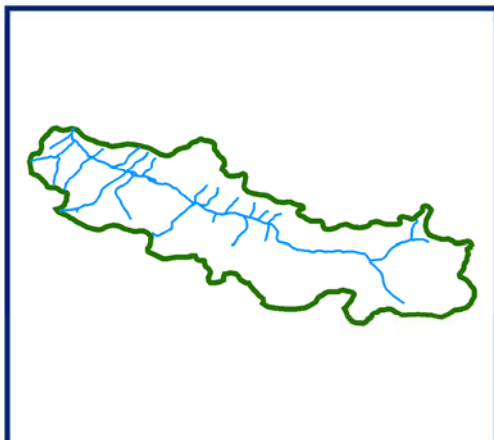
SNOW COVER MAP : BASPA BASIN



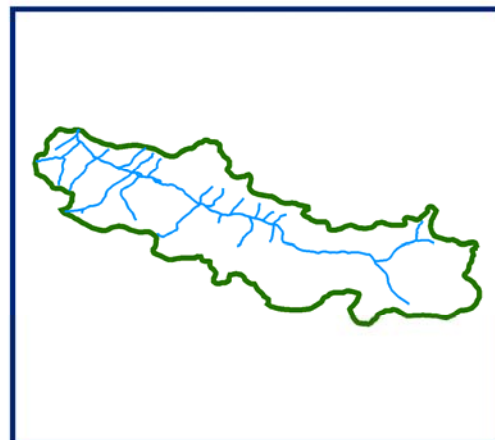
04 APRIL 2010



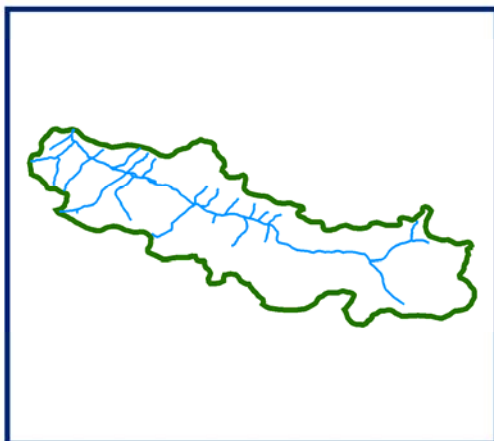
DATA NOT AVAILABLE



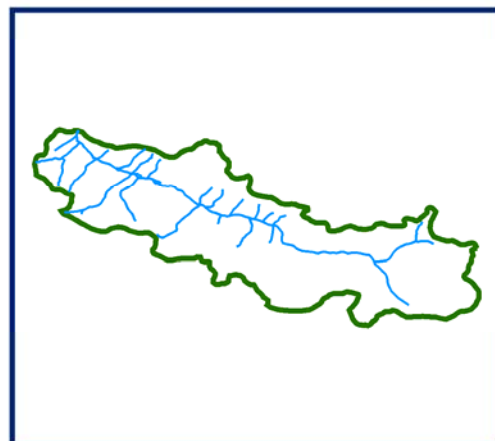
DATA NOT AVAILABLE



DATA NOT AVAILABLE

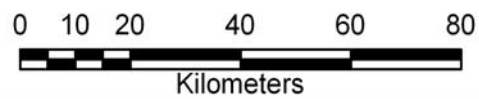


DATA NOT AVAILABLE

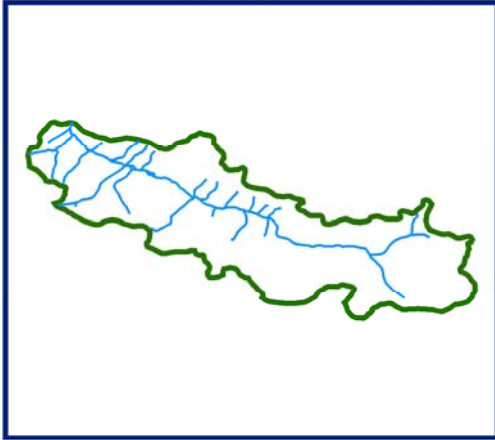


DATA NOT AVAILABLE

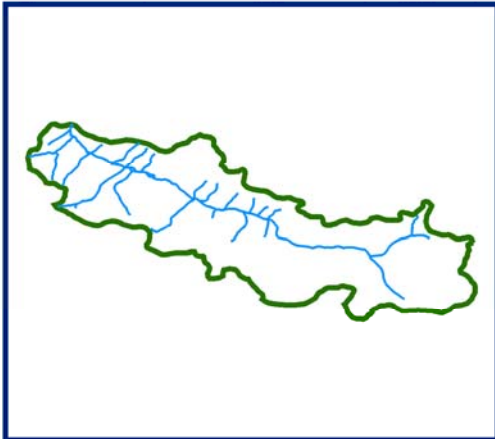
 SNOW



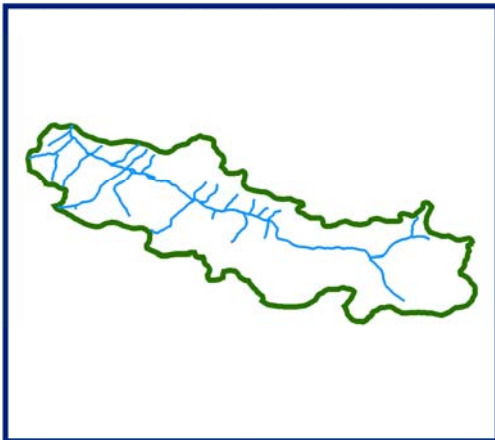
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
DATA NOT AVAILABLE



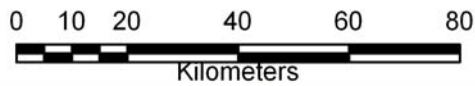
DATA USED
DATA NOT AVAILABLE



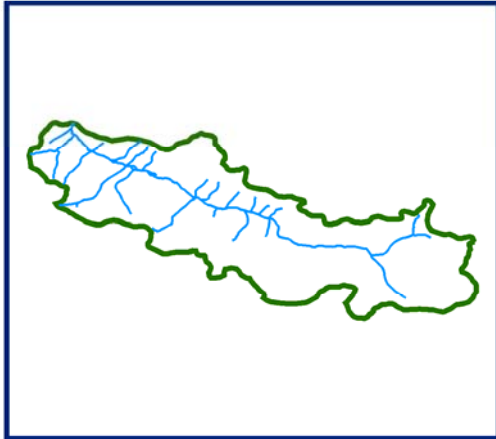
DATA USED
DATA NOT AVAILABLE



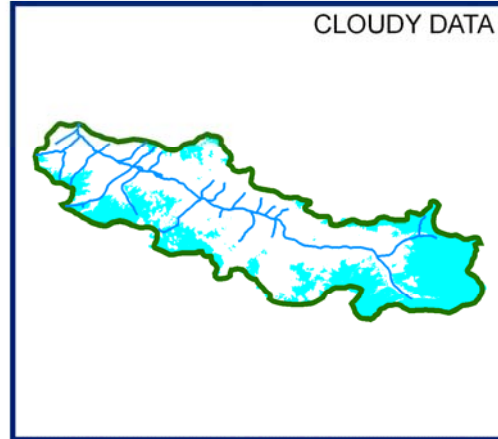
SNOW



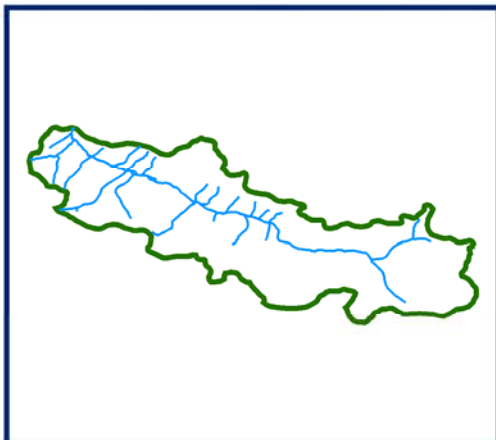
SNOW COVER MAP : BASPA BASIN



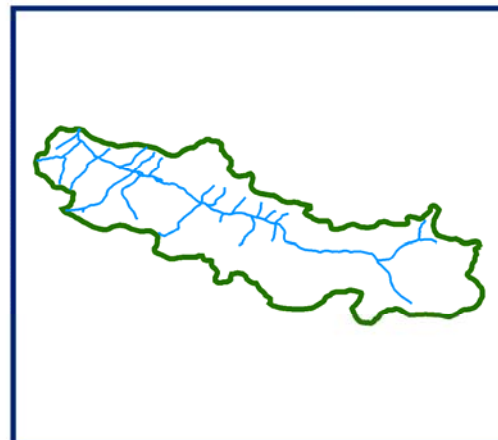
DATA NOT AVAILABLE



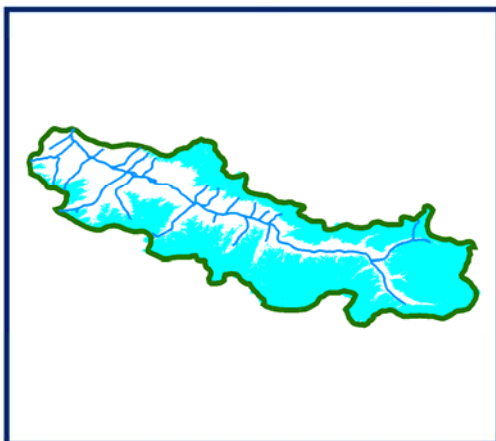
08 MAY 2010



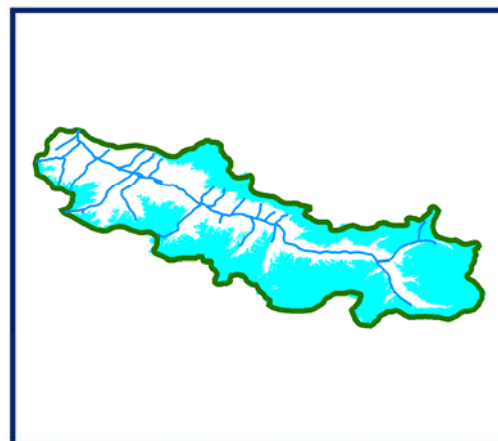
DATA NOT AVAILABLE



DATA NOT AVAILABLE

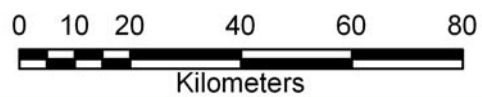


22 MAY 2010

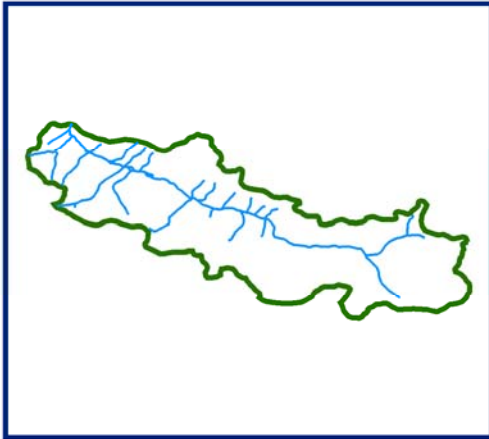


31 MAY 2010

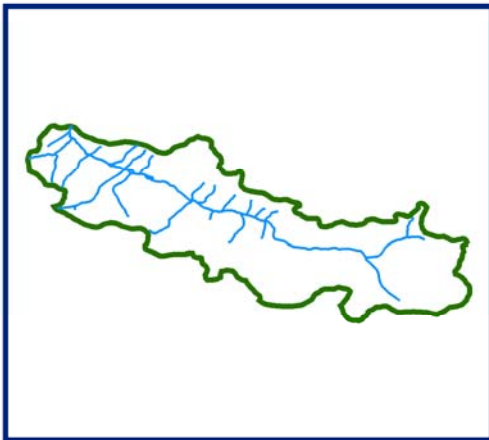
 SNOW



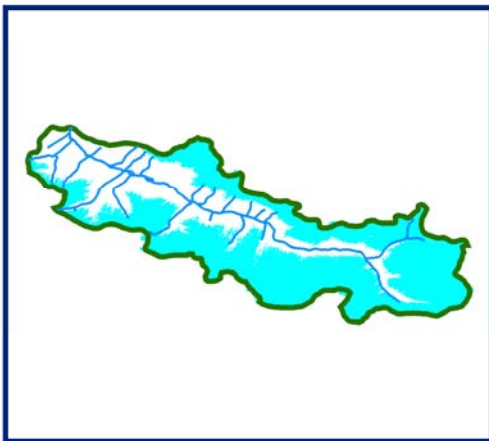
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
DATA NOT AVAILABLE

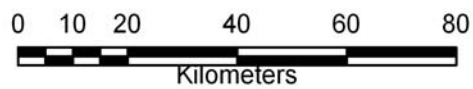


DATA USED
DATA NOT AVAILABLE

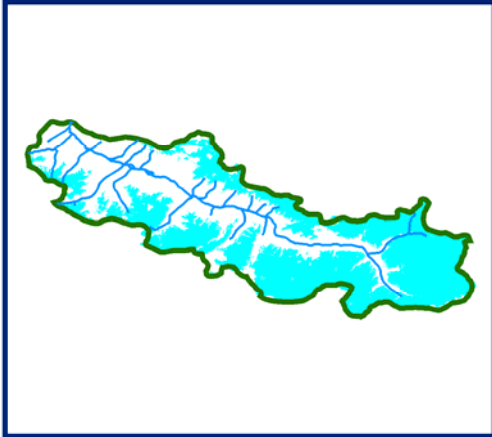


DATA USED
22 MAY 2010
31 MAY 2010

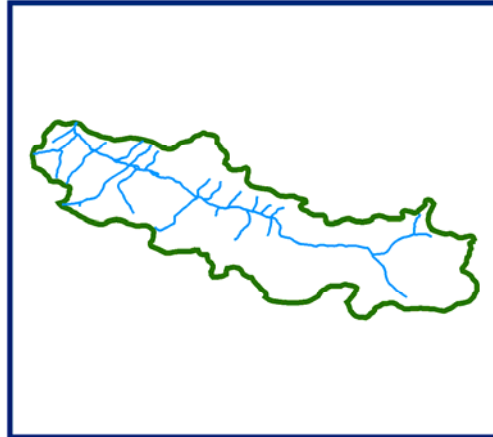
 SNOW



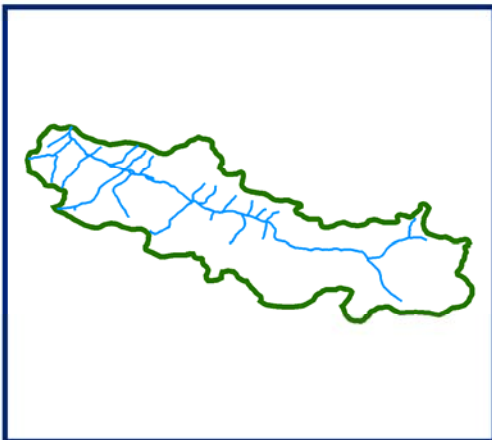
SNOW COVER MAP : BASPA BASIN



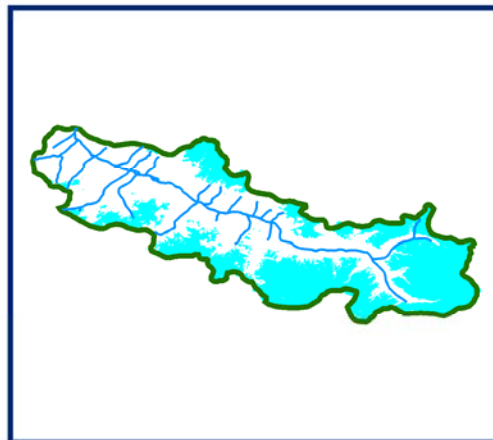
05 JUNE 2010



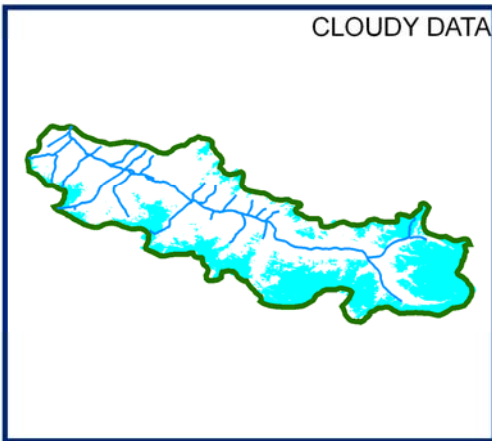
DATA NOT AVAILABLE



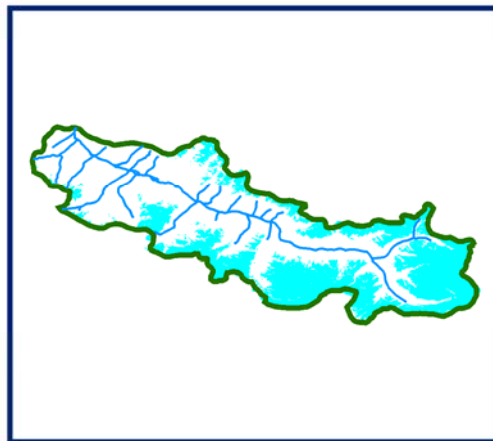
DATA NOT AVAILABLE



20 JUNE 2010

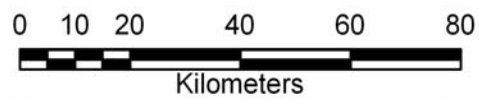


24 JUNE 2010

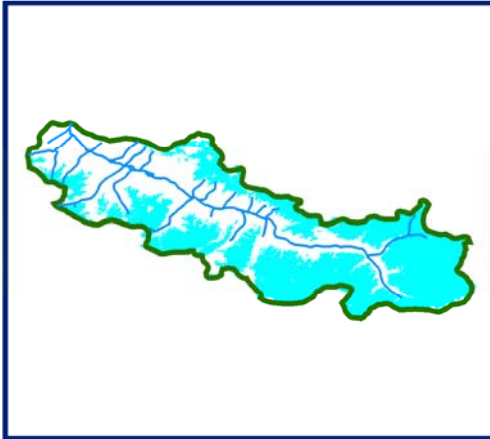


29 JUNE 2010

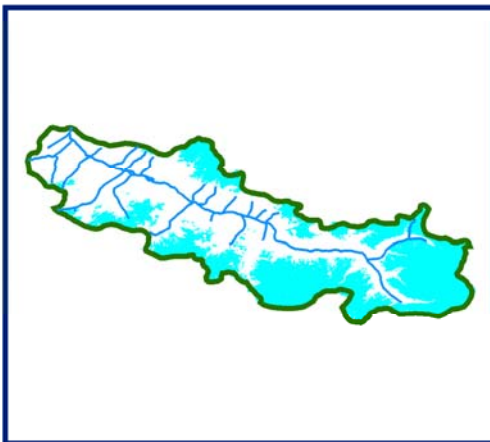
 **SNOW**



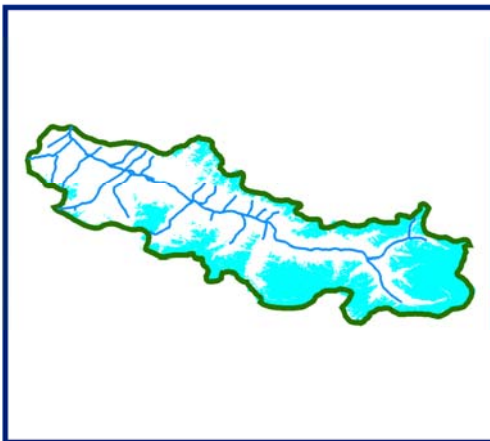
10 DAILY SNOW COVER MAP: BASPA BASIN



DATA USED
05 JUNE 2010



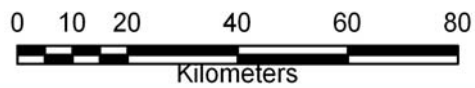
DATA USED
20 JUNE 2010



DATA USED
29 JUNE 2010



SNOW



JIWA BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: JIWA

BASIN AREA: 1444 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009							
1	3-Oct-09	110.6	8	2	4-Oct-09	74.0	5
3	8-Oct-09	373.0	26	4	18-Oct-09	309.6	21
5	27-Oct-09	108.6	8	6	28-Oct-09	113.4	8
November 2009							
7	1-Nov-09	159.3	11	8	6-Nov-09	150.4	10
9	11-Nov-09	664.2	46	10	16-Nov-09	545.8	38
11	20-Nov-09	478.1	33	12	21-Nov-09	479.9	33
13	25-Nov-09	463.0	32	14	30-Nov-09	428.6	30
December 2009							
15	10-Dec-09	852.4	59	16	14-Dec-09	504.2	35
17	19-Dec-09	544.3	38	18	24-Dec-09	602.9	42
19	29-Dec-09	72.7	5				
January 2010							
20	8-Jan-10	502.9	35	21	27-Jan-10	85.0	6
22	31-Jan-10	337.7	23				
February 2010							
23	5-Feb-10	454.9	31	24	10-Feb-10	1209.0	84
March 2010							
25	11-Mar-10	571.0	40				
April 2010							
26	4-Apr-10	277.8	19				
May 2010							
27	8-May-10	375.4	26	28	22-May-10	303.9	21
29	26-May-10	250.3	17	30	31-May-10	318.2	22
June 2010							
31	1-Jun-10	227.6	16	32	5-Jun-10	275.7	19
33	20-Jun-10	197.8	14	34	24-Jun-10	265.2	18
35	29-Jun-10	176.8	12				
July 2010							
36	14-Jul-10	177.2	12				

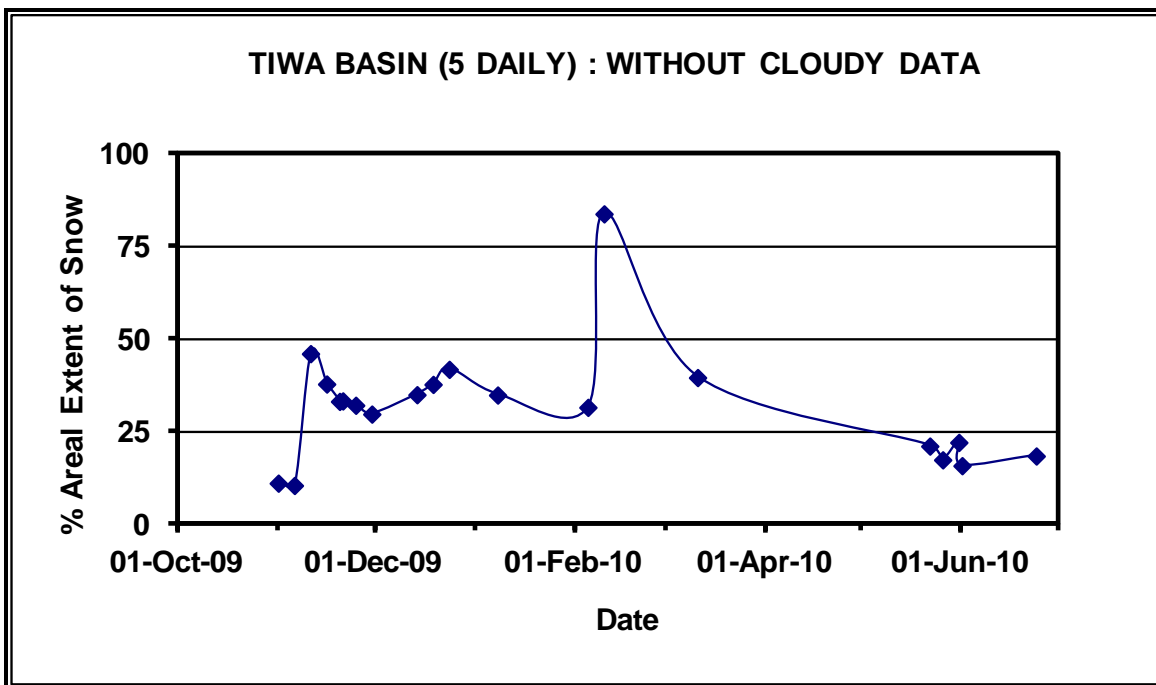
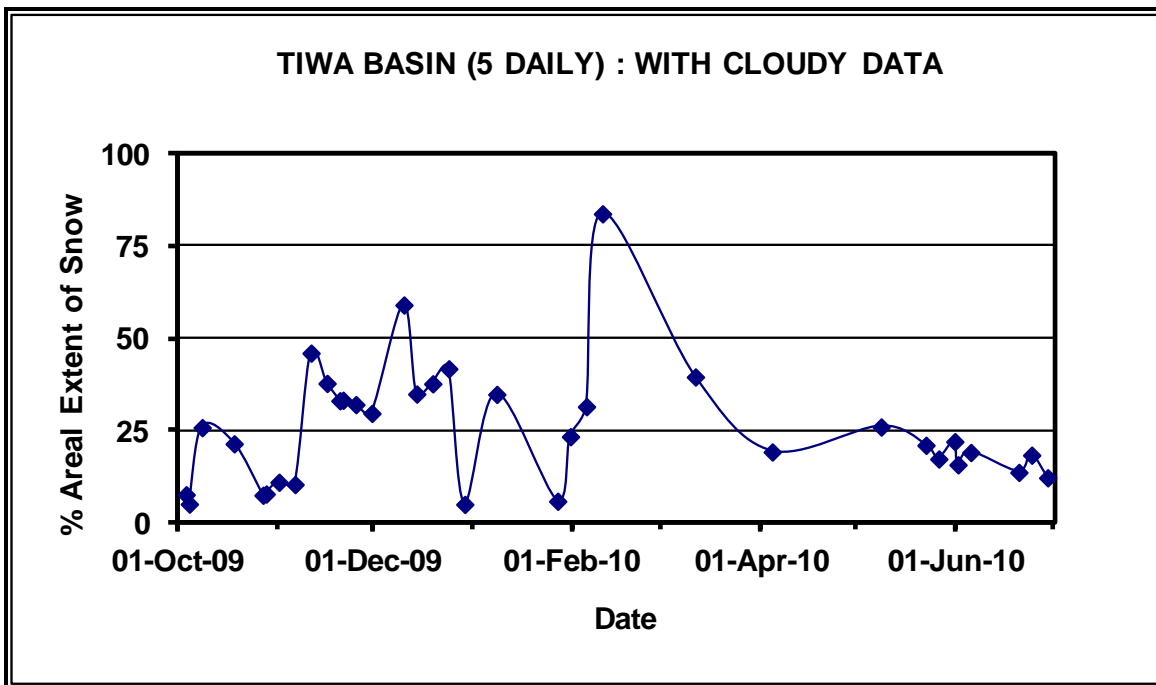
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: JIWA

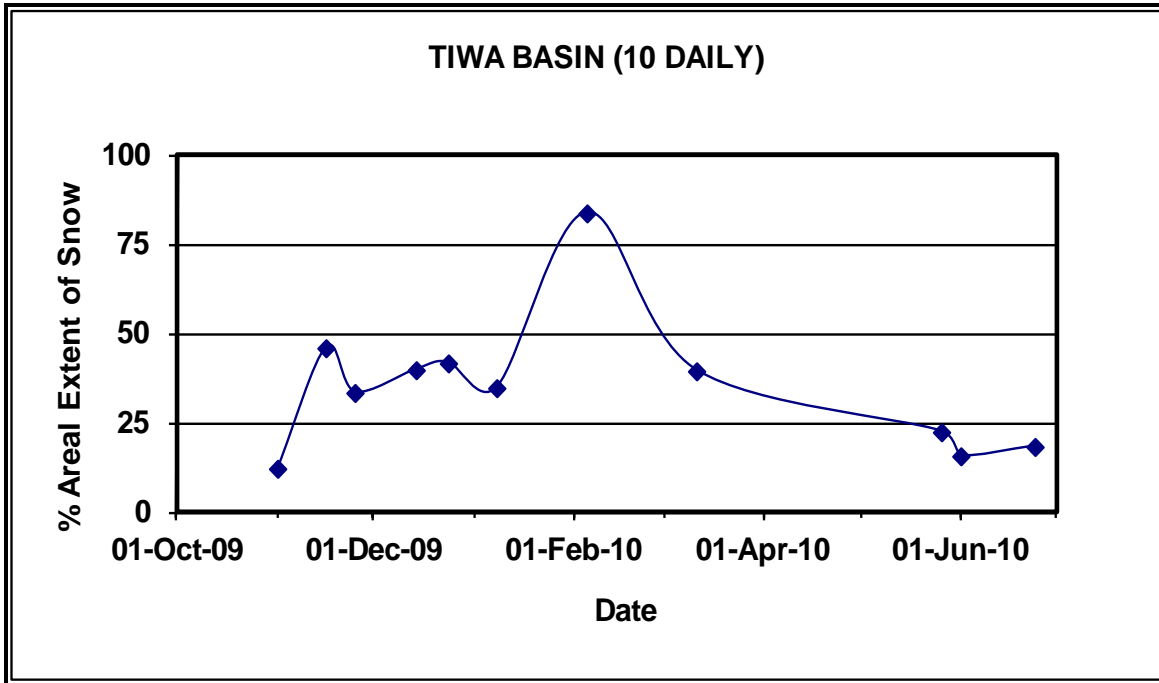
BASIN AREA: 1444 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009				November 2009			
				1	1-Nov-09	177.0	12
				2	16-Nov-09	532.4	37
				3	25-Nov-09	483.5	33
December 2009				January 2010			
4	14-Dec-09	575.4	40	6	8-Jan-10	502.9	35
5	24-Dec-09	602.9	42				
February 2010				March 2010			
7	5-Feb-10	1209.3	84	8	11-Mar-10	571.0	40
April 2010				May 2010			
				9	26-May-10	324.6	22
June 2010				July 2010			
10	1-Jun-10	227.6	16	12	14-Jul-10	177.2	12
11	24-Jun-10	265.2	18				

Snow cover depletion curve

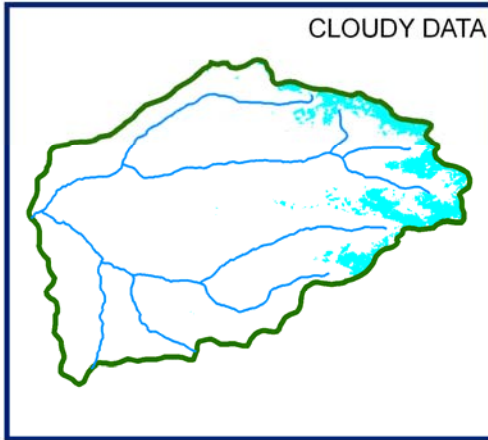


Snow cover depletion curve

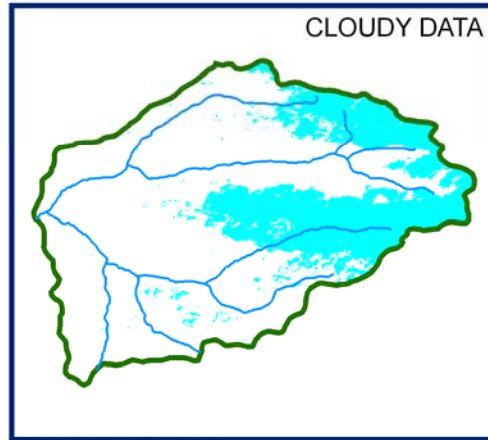


SNOW COVER MAP

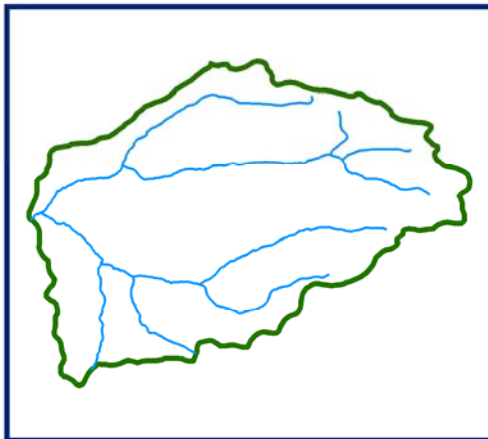
SNOW COVER MAP : TIWA BASIN



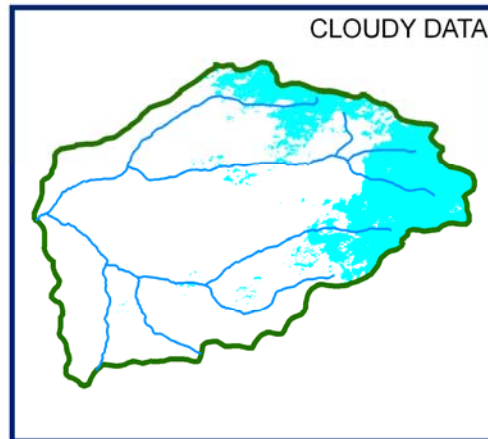
03 OCTOBER 2009



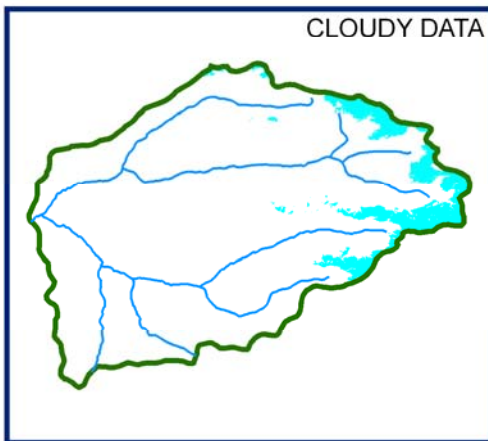
08 OCTOBER 2009



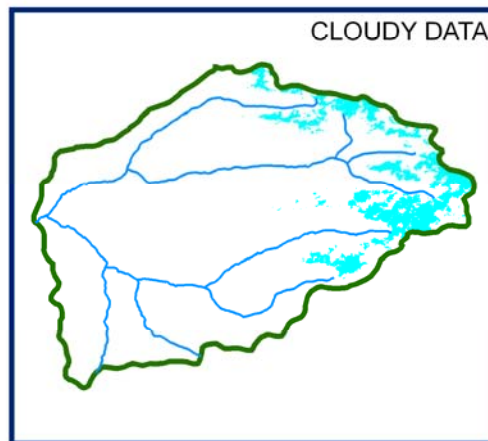
DATA NOT AVAILABLE



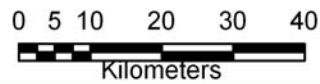
18 OCTOBER 2009



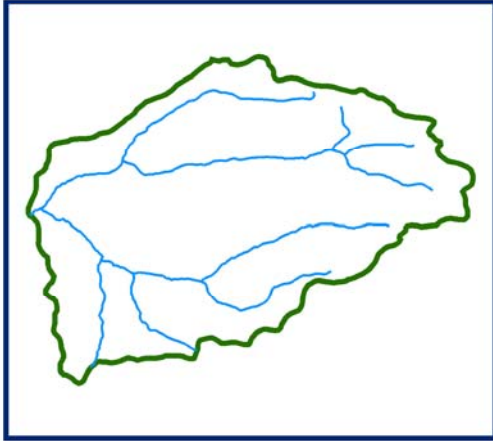
27 OCTOBER 2009



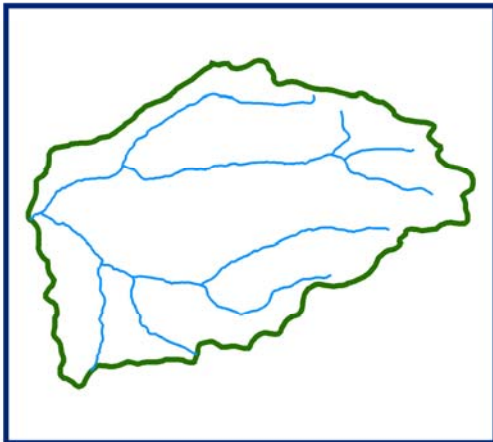
28 OCTOBER 2009



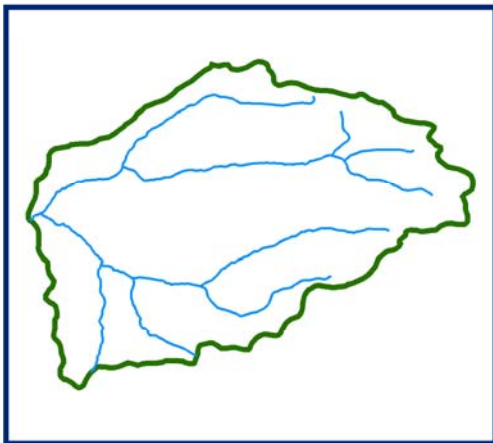
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
DATA NOT AVAILABLE

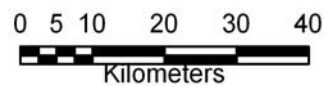


DATA USED
DATA NOT AVAILABLE

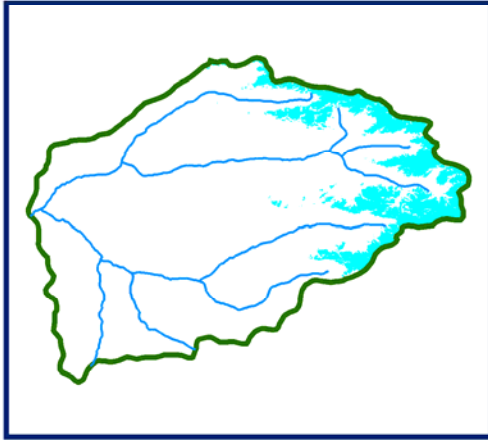


DATA USED
DATA NOT AVAILABLE

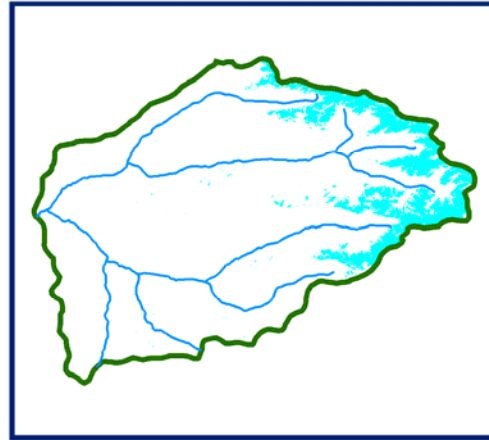
 SNOW



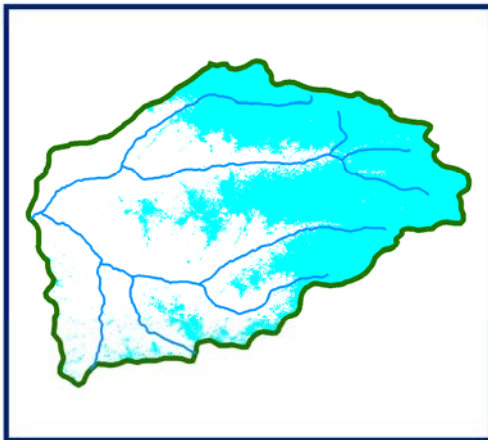
SNOW COVER MAP : TIWA BASIN



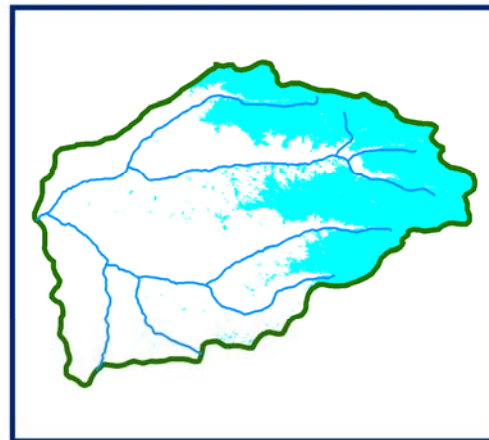
01 NOVEMBER 2009



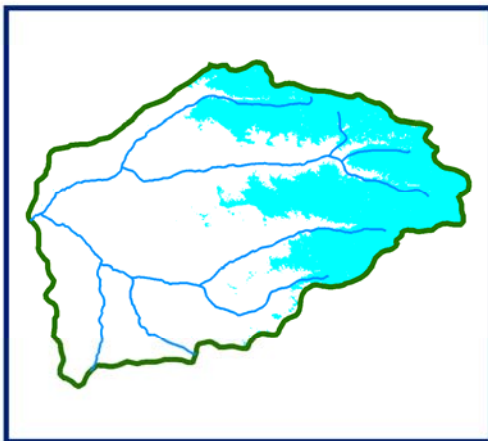
06 NOVEMBER 2009



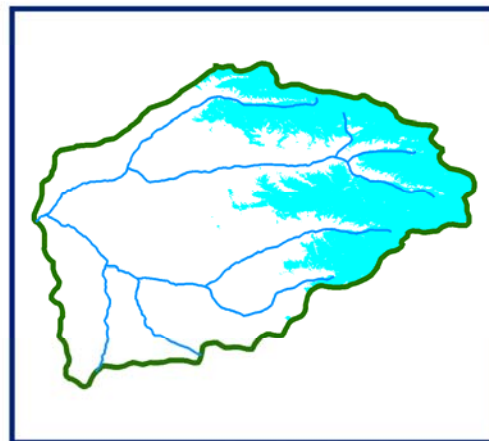
11 NOVEMBER 2009



20 NOVEMBER 2009



21 NOVEMBER 2009

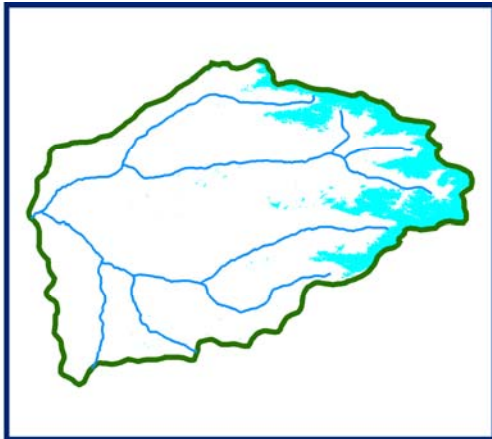


30 NOVEMBER 2009

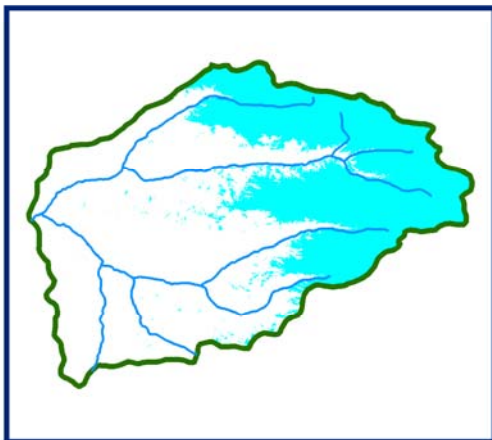
 SNOW



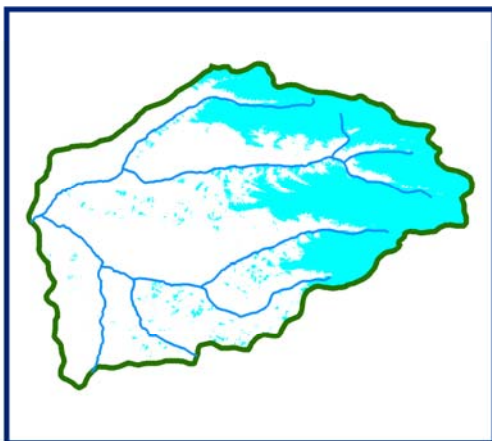
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
01 NOVEMBER 2009
06 NOVEMBER 2009

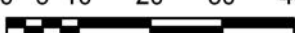


DATA USED
11 NOVEMBER 2009
16 NOVEMBER 2009
20 NOVEMBER 2009

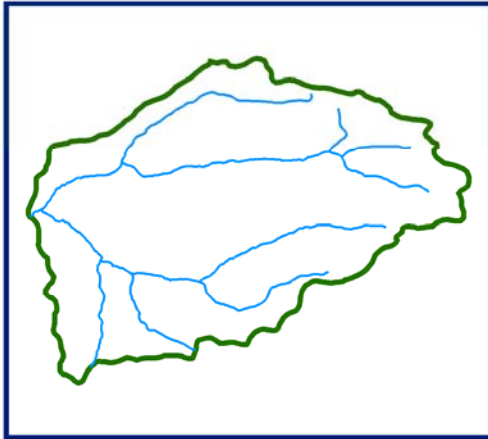


DATA USED
21 NOVEMBER 2009
25 NOVEMBER 2009
30 NOVEMBER 2009

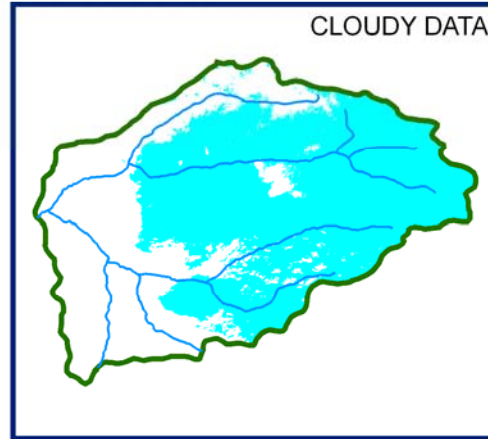
 SNOW

0 5 10 20 30 40

Kilometers

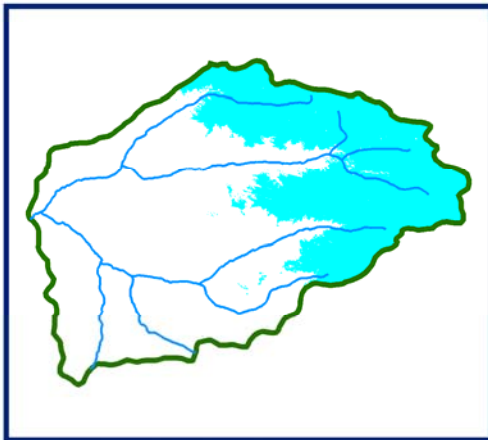
SNOW COVER MAP : TIWA BASIN



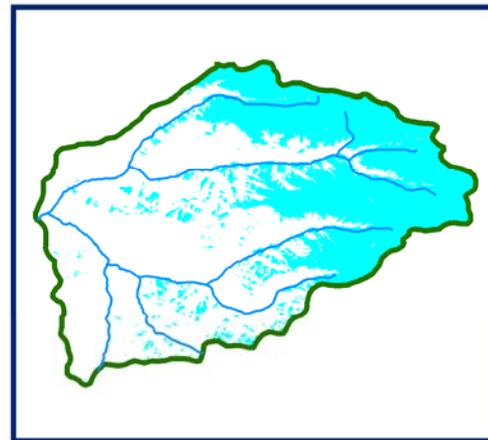
DATA NOT AVAILABLE



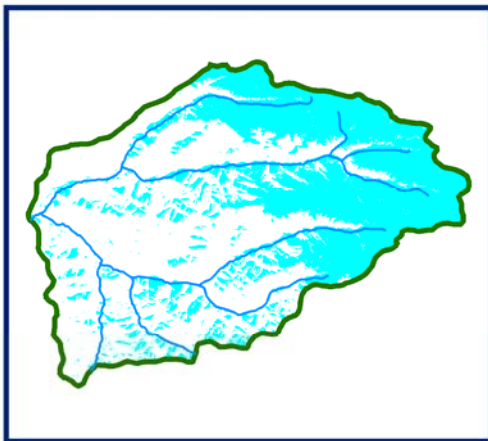
10 DECEMBER 2009



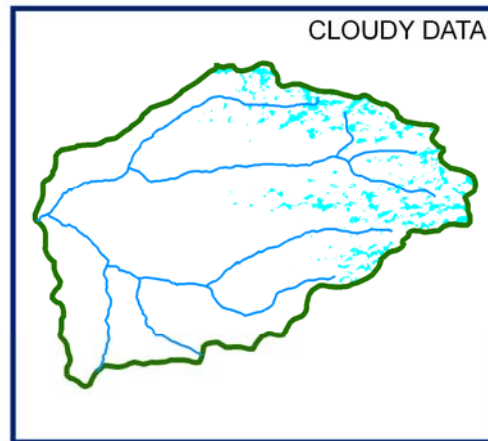
14 DECEMBER 2009



19 DECEMBER 2009

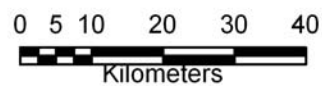


24 DECEMBER 2009

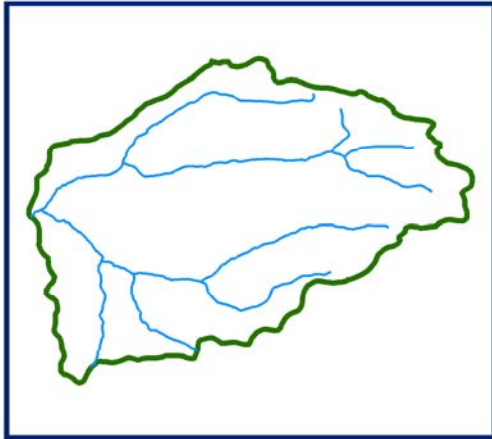


29 DECEMBER 2009

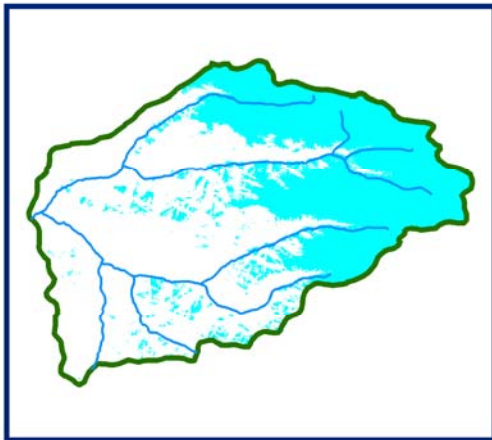
 SNOW



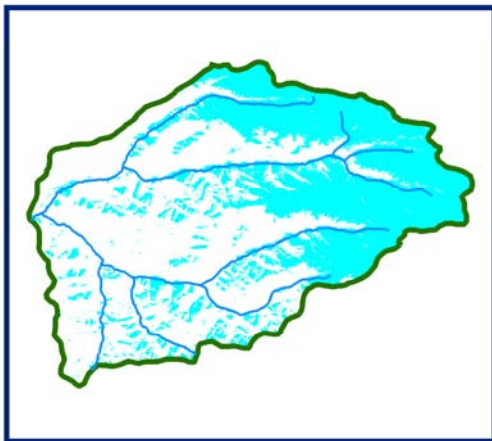
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
DATA NOT AVAILABLE

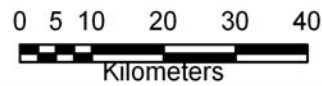


DATA USED
14 DECEMBER 2009
19 DECEMBER 2009

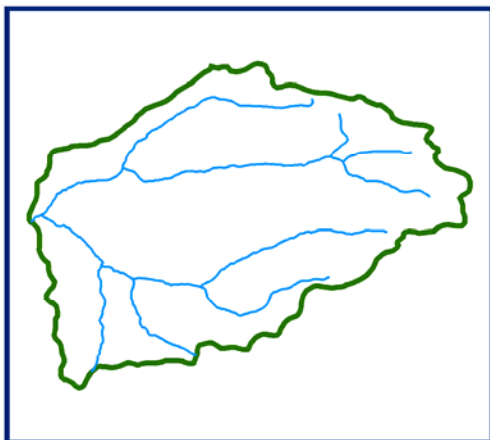


DATA USED
24 DECEMBER 2009

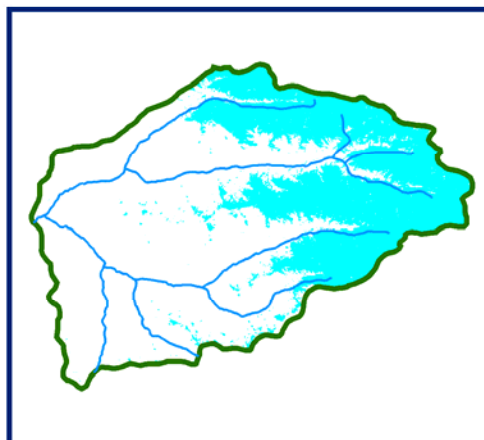
 SNOW



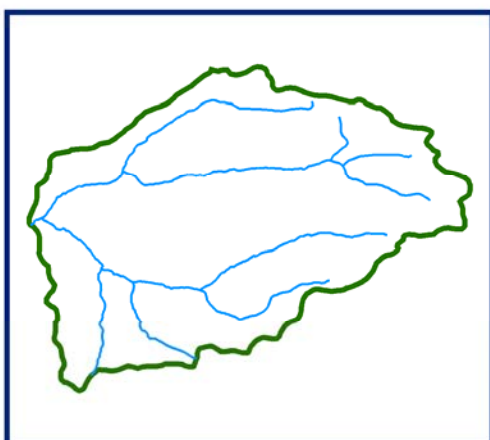
SNOW COVER MAP : TIWA BASIN



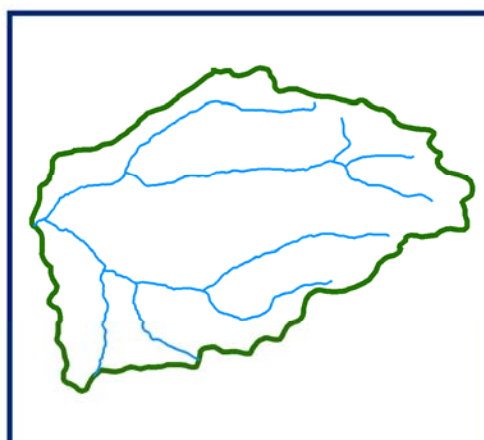
DATA NOT AVAILABLE



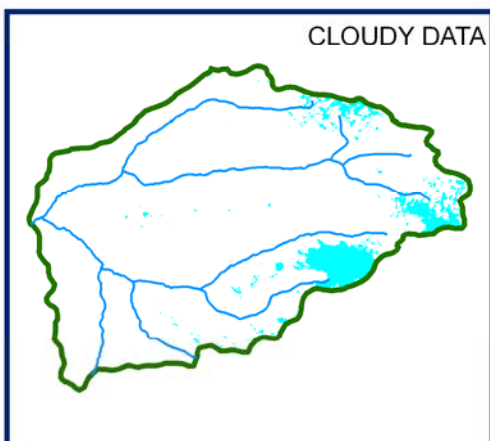
08 JANUARY 2010



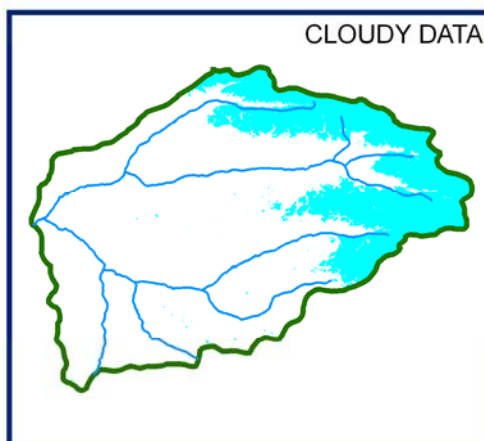
DATA NOT AVAILABLE



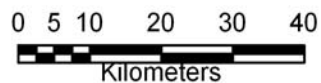
DATA NOT AVAILABLE



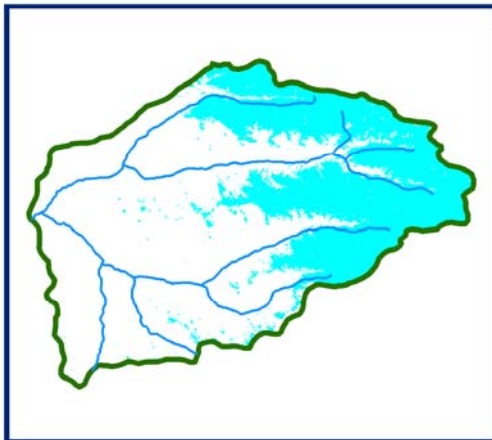
27 JANUARY 2010



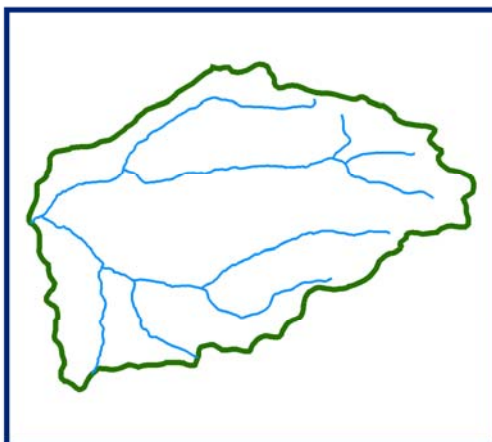
31 JANUARY 2010



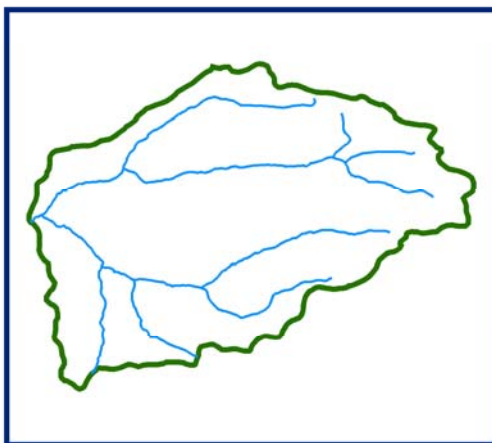
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
08 JANUARY 2010

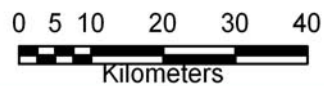


DATA USED
DATA NOT AVAILABLE

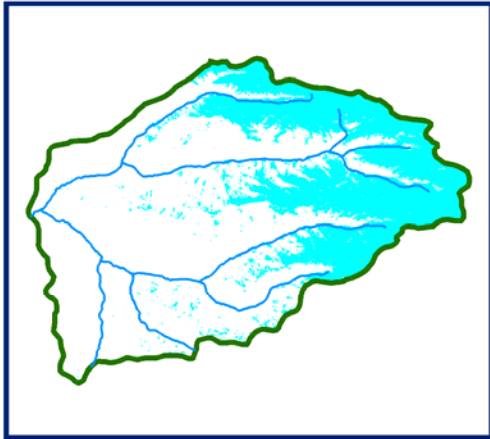


DATA USED
DATA NOT AVAILABLE

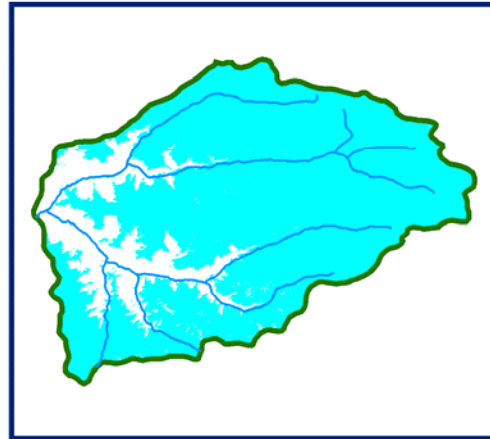
 SNOW



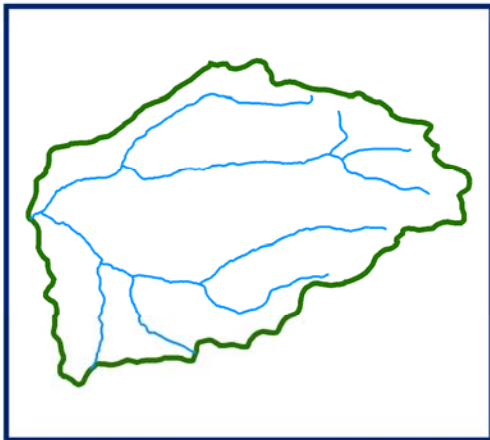
SNOW COVER MAP : TIWA BASIN



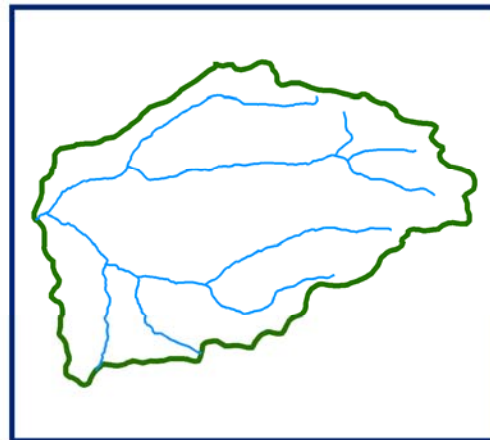
05 FEBRUARY 2010



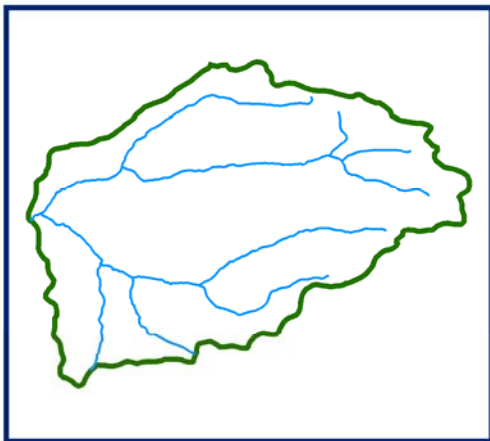
10 FEBRUARY 2010



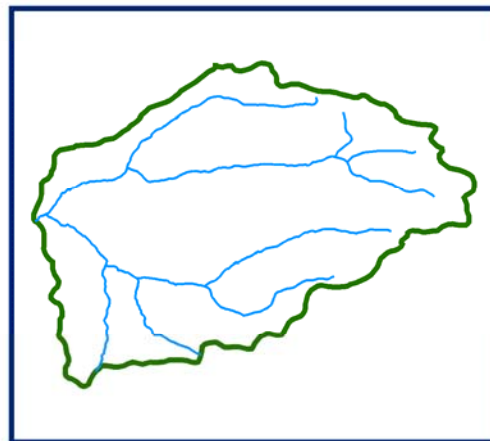
DATA NOT AVAILABLE



DATA NOT AVAILABLE



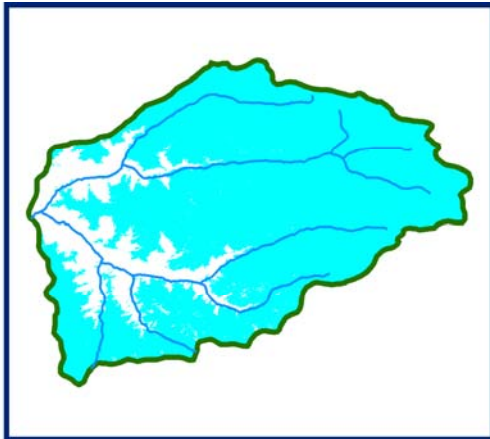
DATA NOT AVAILABLE



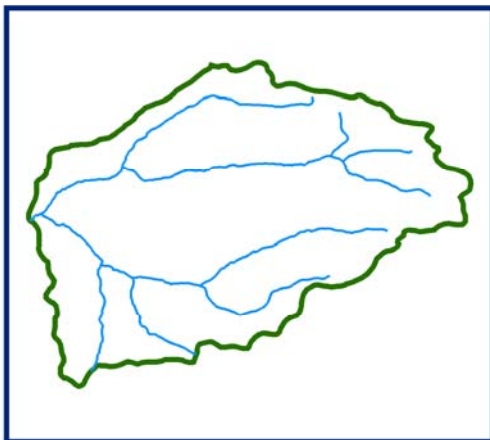
DATA NOT AVAILABLE



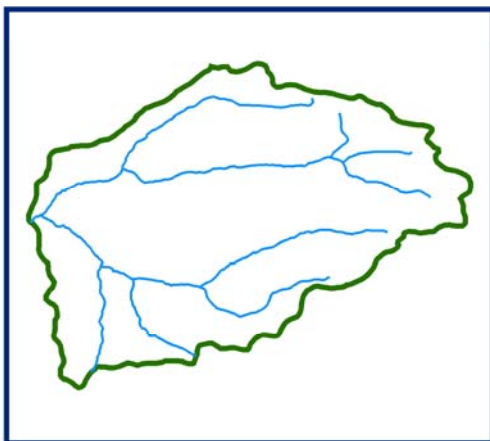
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
05 FEBRUARY 2010
10 FEBRUARY 2010

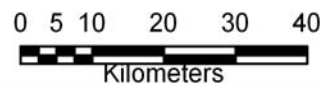


DATA USED
DATA NOT AVAILABLE

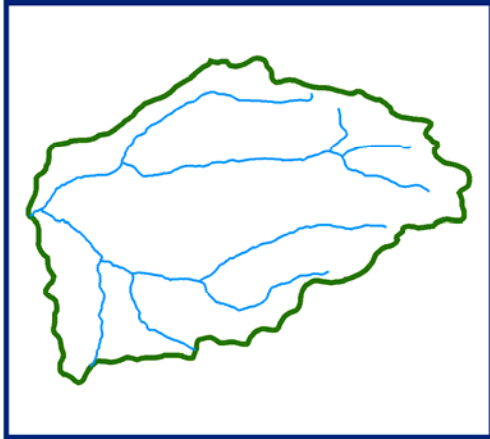


DATA USED
DATA NOT AVAILABLE

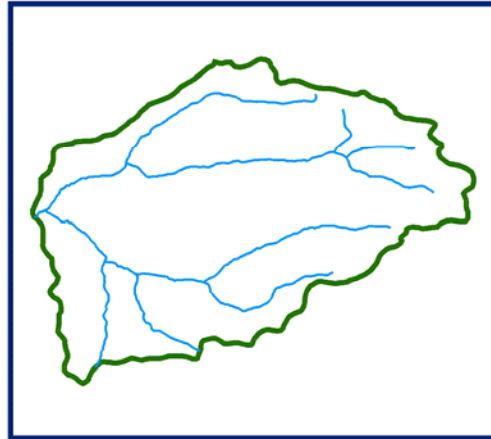
 SNOW



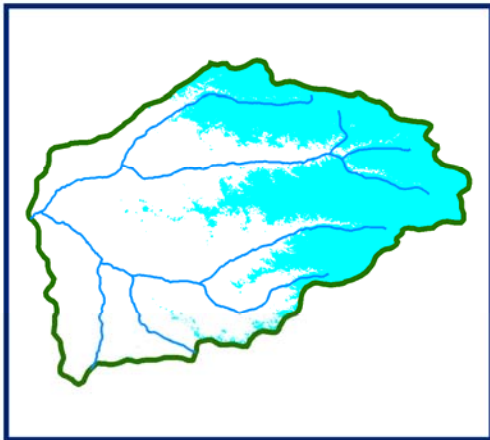
SNOW COVER MAP : TIWA BASIN



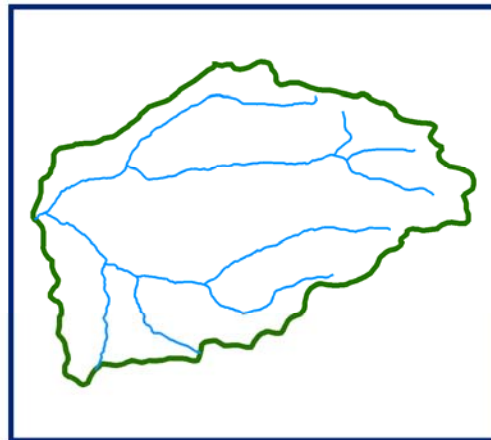
DATA NOT AVAILABLE



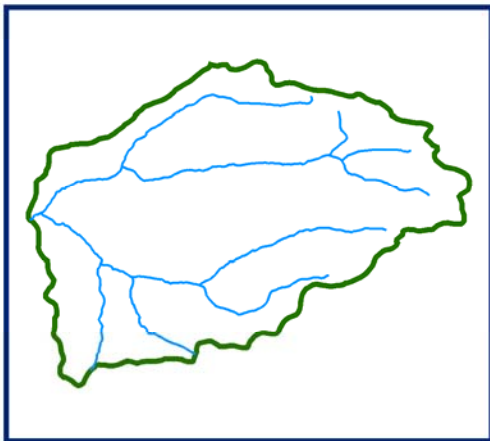
DATA NOT AVAILABLE



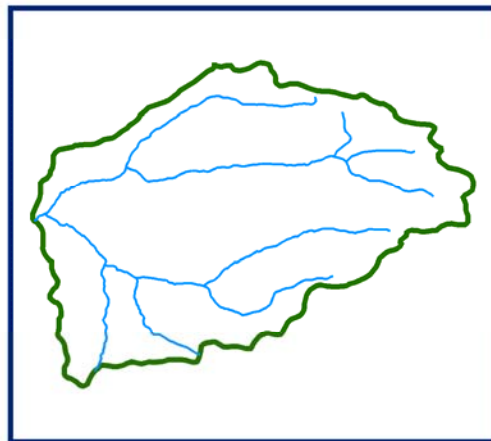
11 MARCH 2010



DATA NOT AVAILABLE

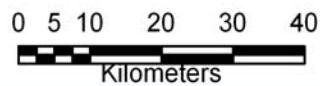


DATA NOT AVAILABLE

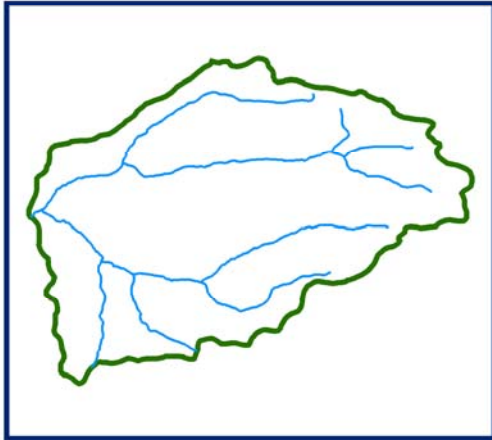


DATA NOT AVAILABLE

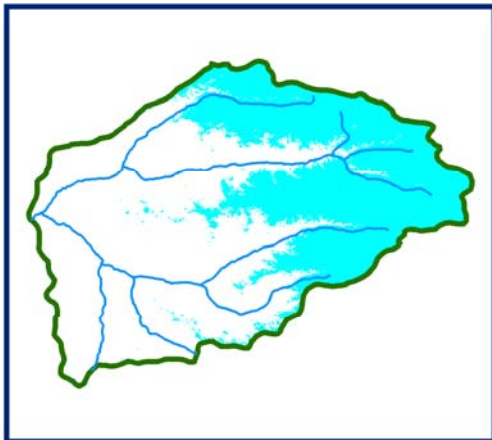
 SNOW



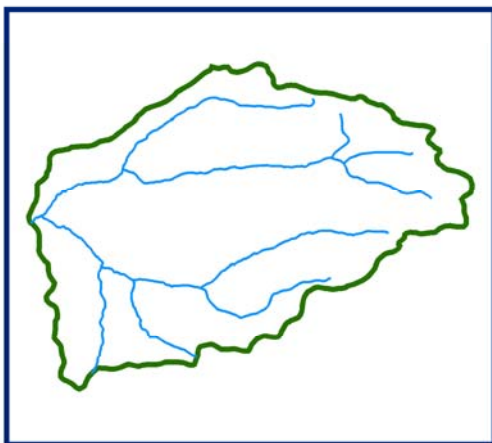
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
DATA NOT AVAILABLE

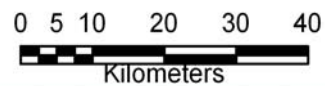


DATA USED
11 MARCH 2010

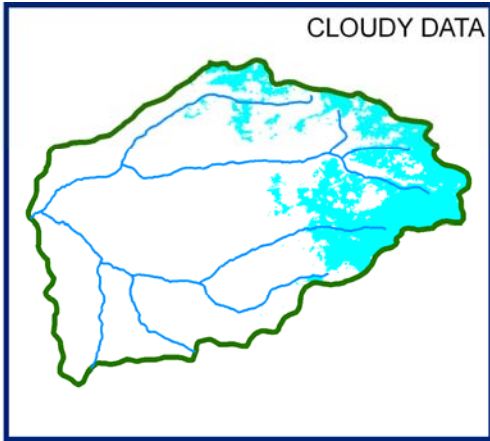


DATA USED
DATA NOT AVAILABLE

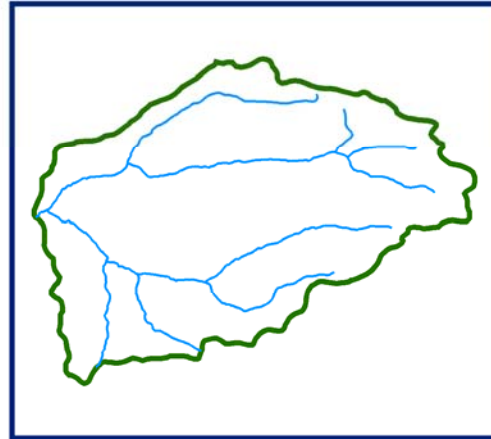
 SNOW



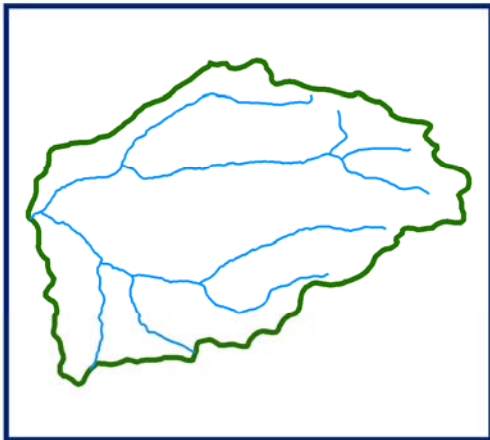
SNOW COVER MAP : TIWA BASIN



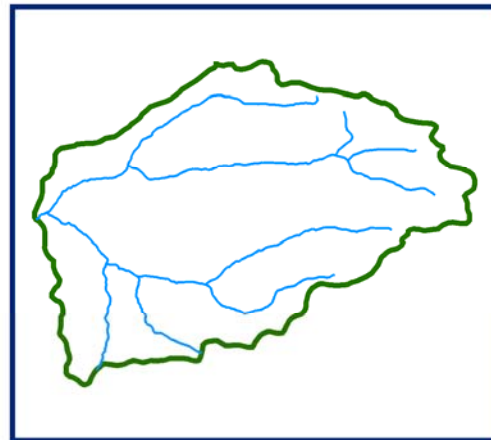
04 APRIL 2010



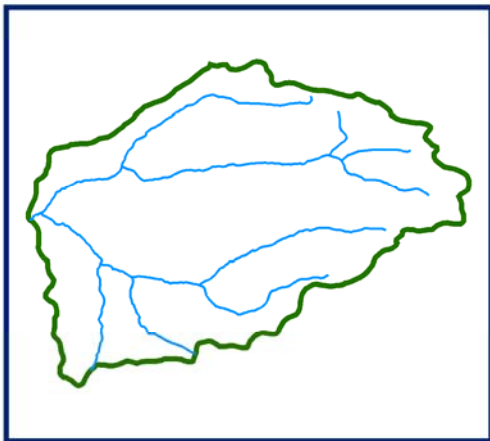
DATA NOT AVAILABLE



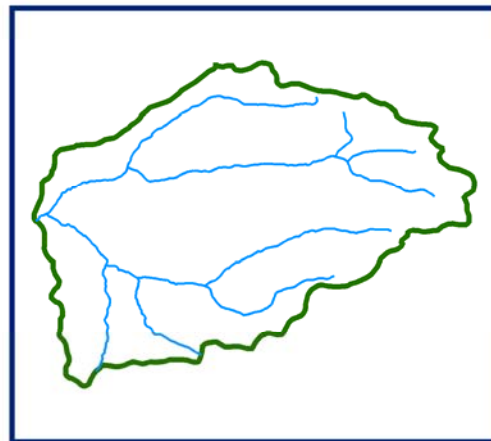
DATA NOT AVAILABLE



DATA NOT AVAILABLE



DATA NOT AVAILABLE

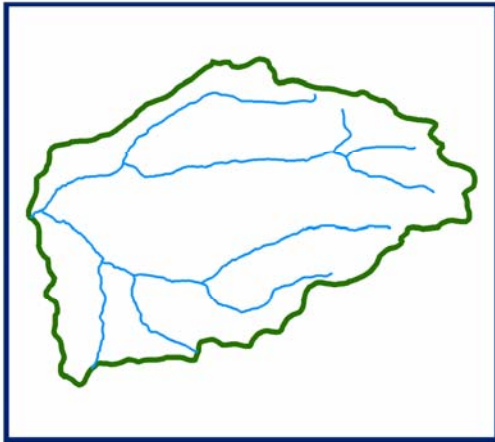


DATA NOT AVAILABLE

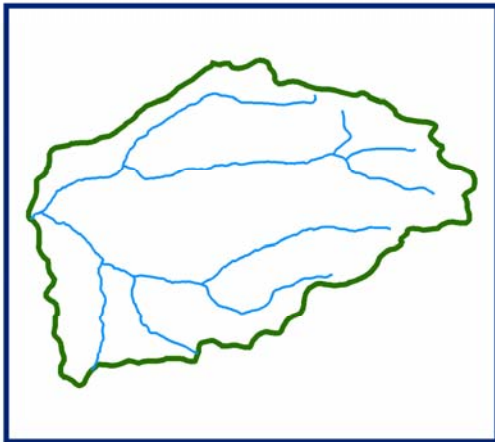
 SNOW



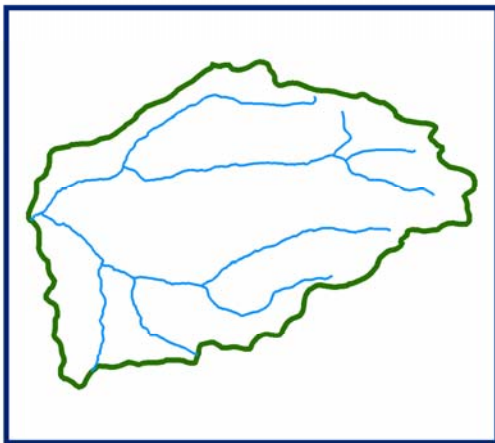
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
DATA NOT AVAILABLE

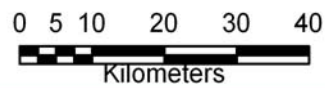


DATA USED
DATA NOT AVAILABLE

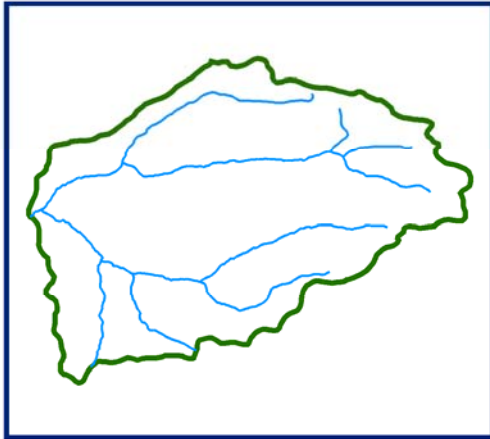


DATA USED
DATA NOT AVAILABLE

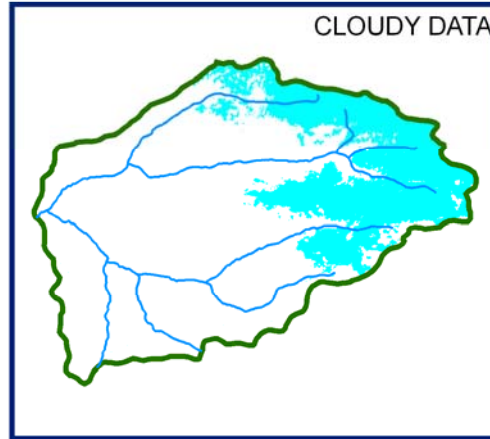
 SNOW



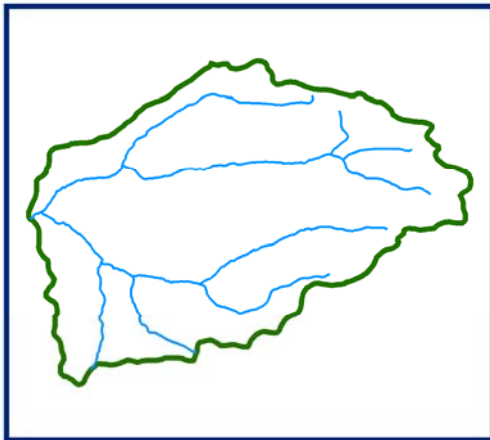
SNOW COVER MAP : TIWA BASIN



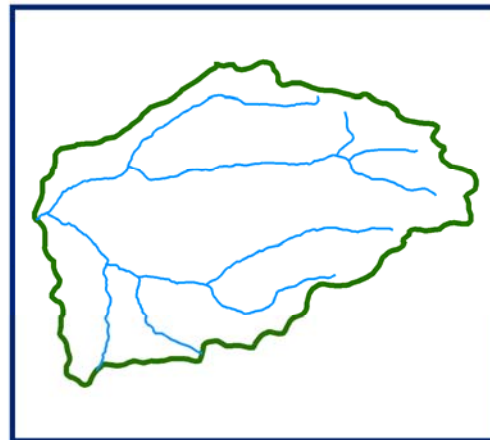
DATA NOT AVAILABLE



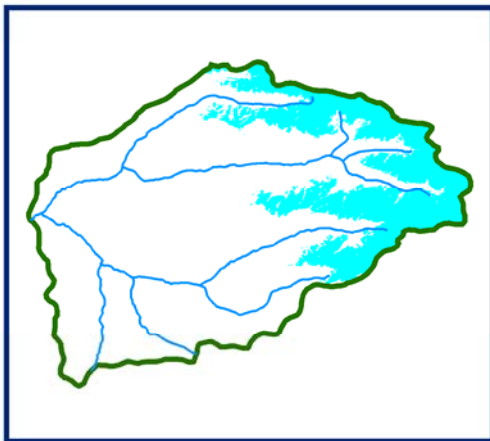
08 MAY 2010



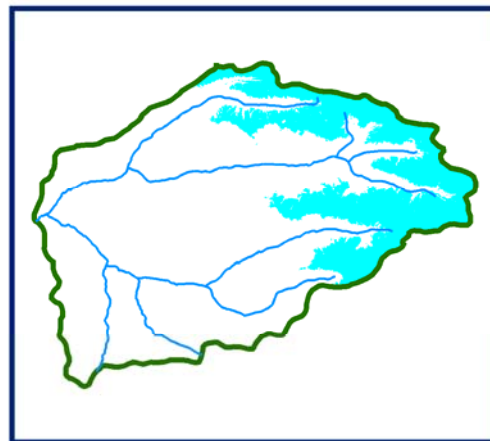
DATA NOT AVAILABLE



DATA NOT AVAILABLE

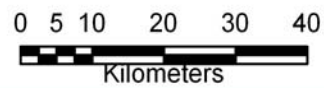


22 MAY 2010

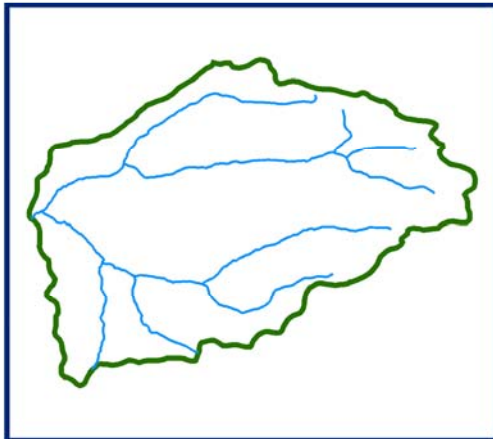


31 MAY 2010

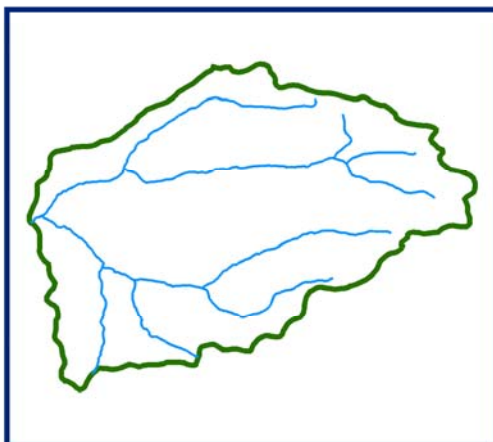
 SNOW



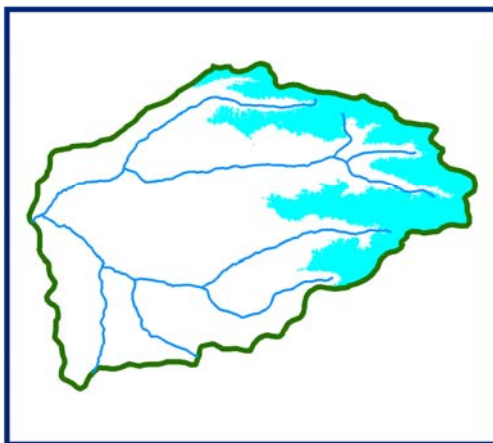
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
DATA NOT AVAILABLE

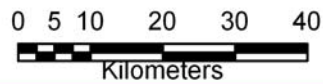


DATA USED
DATA NOT AVAILABLE

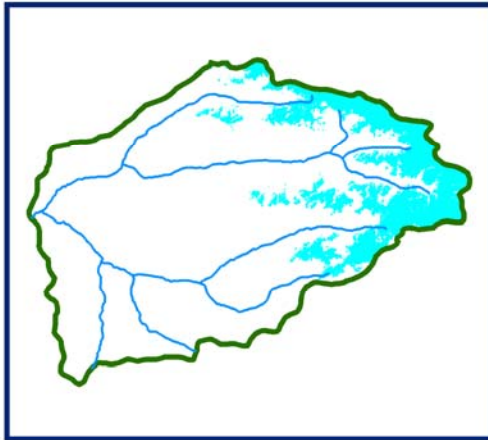


DATA USED
22 MAY 2010
26 MAY 2010
31 MAY 2010

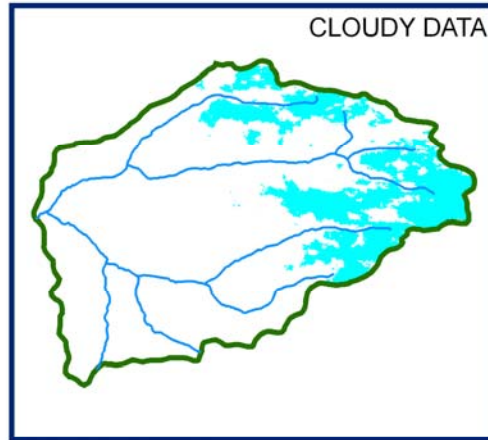
 SNOW



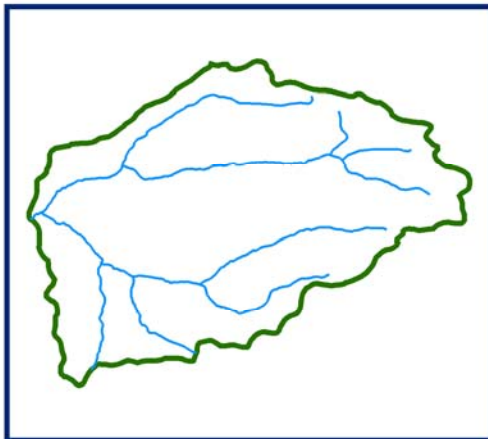
SNOW COVER MAP : TIWA BASIN



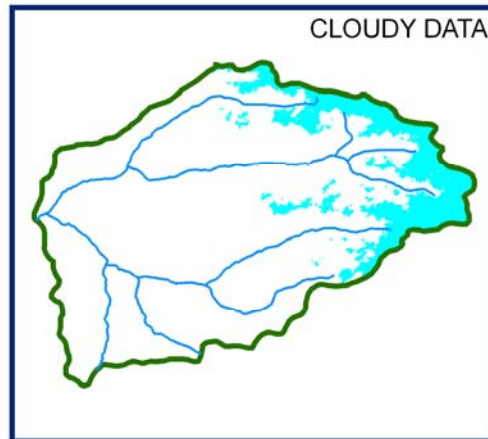
01 JUNE 2010



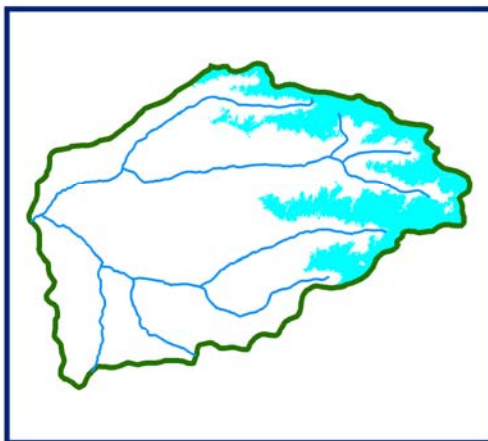
05 JUNE 2010



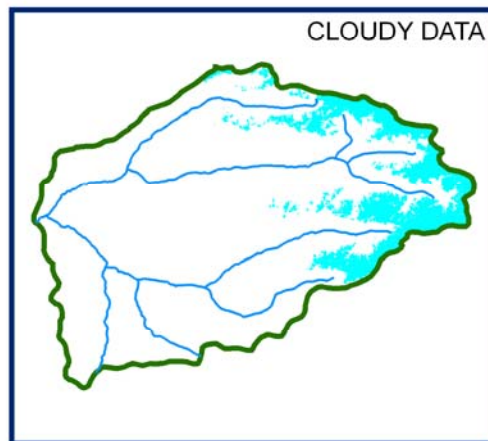
DATA NOT AVAILABLE



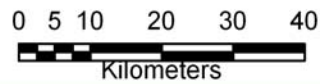
20 JUNE 2010



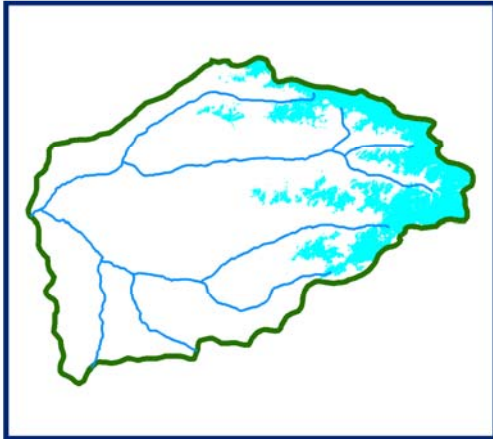
24 JUNE 2010



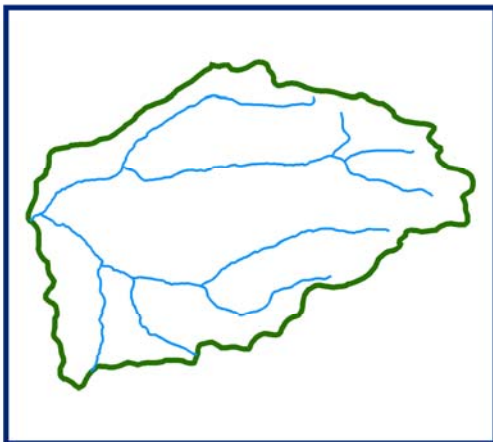
29 JUNE 2010



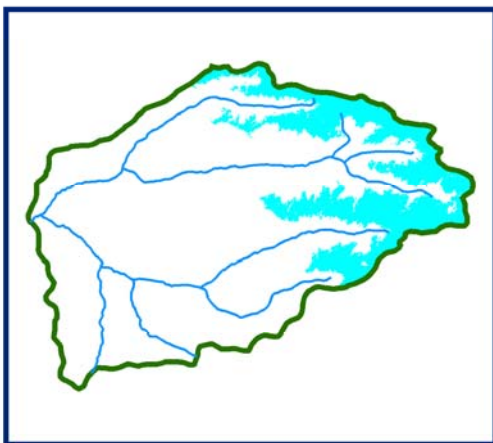
10 DAILY SNOW COVER MAP: TIWA BASIN



DATA USED
01 JUNE 2010

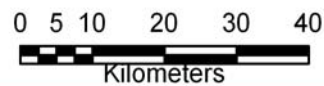


DATA USED
DATA NOT AVAILABLE



DATA USED
24 JUNE 2010

 SNOW



PARBATI BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: PARBATI

BASIN AREA: 1772 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009							
1	3-Oct-09	753.8	43	2	4-Oct-09	661.3	37
3	8-Oct-09	738.7	42	4	18-Oct-09	1124.4	63
5	22-Oct-09	907.6	51	6	27-Oct-09	844.2	48
7	28-Oct-09	626.3	35				
November 2009							
8	1-Nov-09	782.2	44	9	6-Nov-09	762.3	43
10	11-Nov-09	1525.1	86	11	20-Nov-09	1361.4	77
12	21-Nov-09	1324.7	75	13	25-Nov-09	1320.2	75
14	30-Nov-09	1022.5	58				
December 2009							
15	10-Dec-09	707.9	40	16	14-Dec-09	1401.3	79
17	19-Dec-09	1418.2	80	18	24-Dec-09	1419.0	80
19	29-Dec-09	319.0	18				
January 2010							
20	2-Jan-10	1317.7	74	21	8-Jan-10	1344.5	76
22	27-Jan-10	421.7	24	23	31-Jan-10	1302.1	73
February 2010							
24	5-Feb-10	1332.3	75	25	10-Feb-10	1730.5	98
March 2010							
26	11-Mar-10	1434.1	81				
April 2010							
27	4-Apr-10	1267.2	72				
May 2010							
28	8-May-10	1071.0	60	29	22-May-10	1078.3	61
30	26-May-10	1027.8	58	31	31-May-10	1107.7	63
June 2010							
32	1-Jun-10	1014.2	57	33	5-Jun-10	742.6	42
34	19-Jun-10	1020.5	58	35	20-Jun-10	964.2	54
36	24-Jun-10	910.8	51	37	29-Jun-10	813.6	46
July 2010							
38	14-Jul-10	816.9	46				

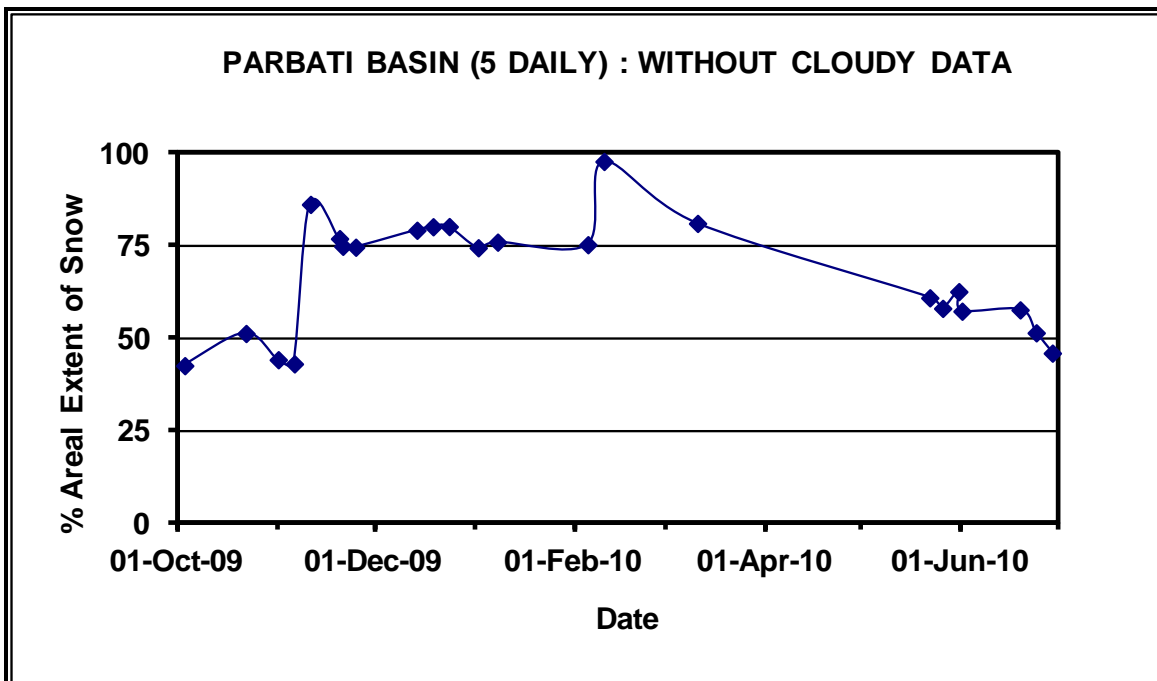
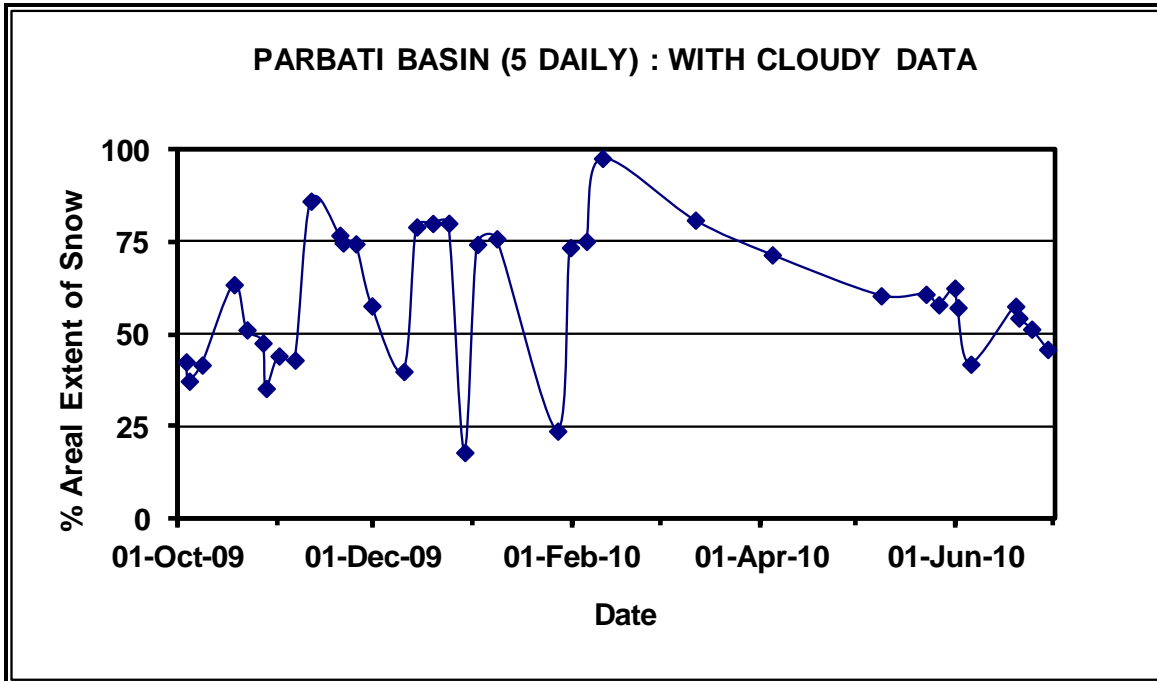
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: PARBATI

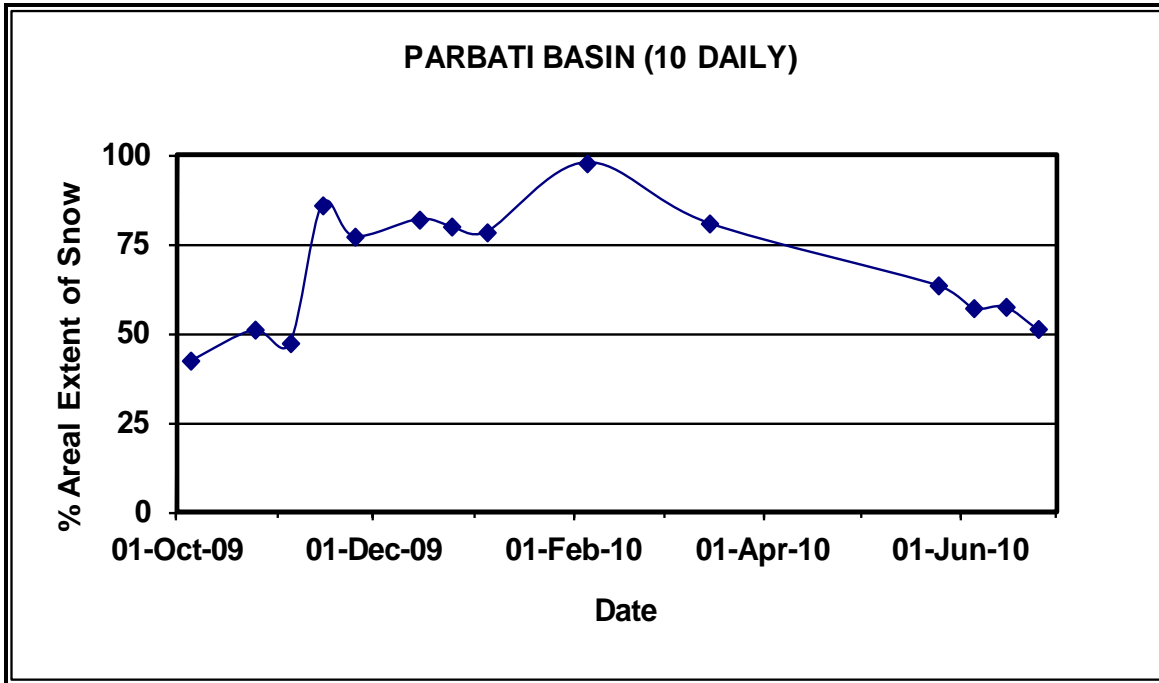
BASIN AREA: 1772 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009				November 2009			
1	3-Oct-09	753.8	43	3	1-Nov-09	840.6	47
2	22-Oct-09	907.6	51	4	11-Nov-09	1465.7	83
				5	21-Nov-09	1368.6	77
December 2009				January 2010			
6	14-Dec-09	1453.1	82	8	2-Jan-10	1390.1	78
7	24-Dec-09	1419.0	80				
February 2010				March 2010			
9	5-Feb-10	1732.6	98	10	11-Mar-10	1434.1	81
April 2010				May 2010			
				11	26-May-10	1127.0	64
June 2010				July 2010			
12	1-Jun-10	1014.2	57	15	14-Jul-10	816.9	46
13	19-Jun-10	1020.5	58				
14	24-Jun-10	910.8	51				

Snow cover depletion curve

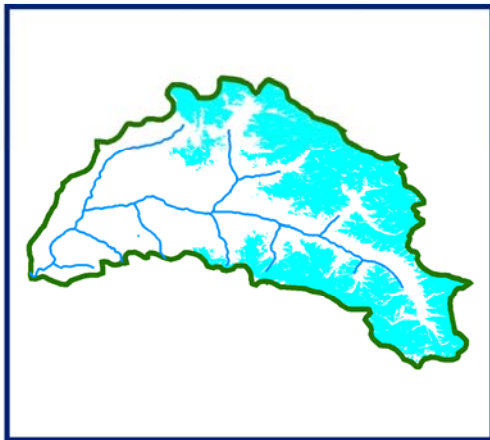


Snow cover depletion curve

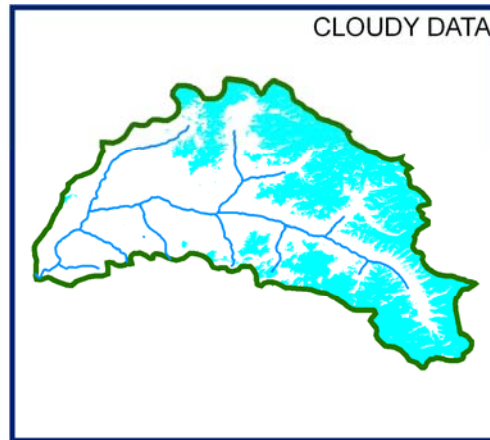


SNOW COVER MAP

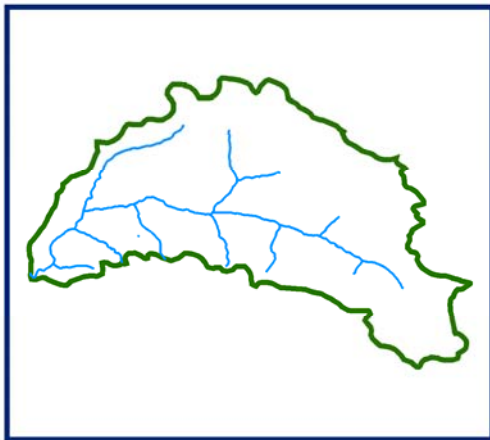
SNOW COVER MAP : PARBATI BASIN



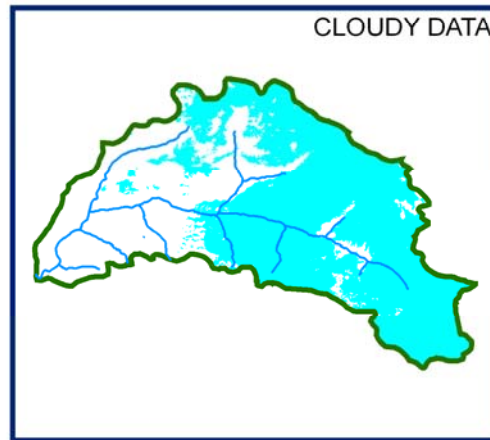
03 OCTOBER 2009



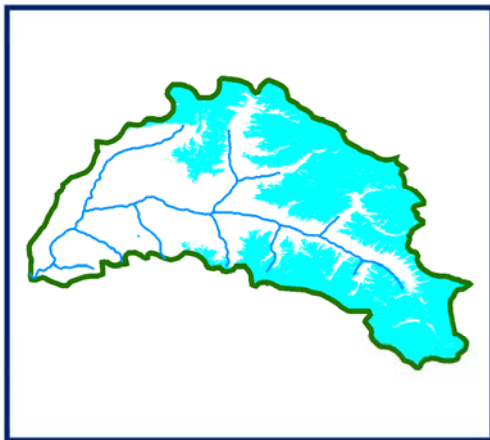
08 OCTOBER 2009



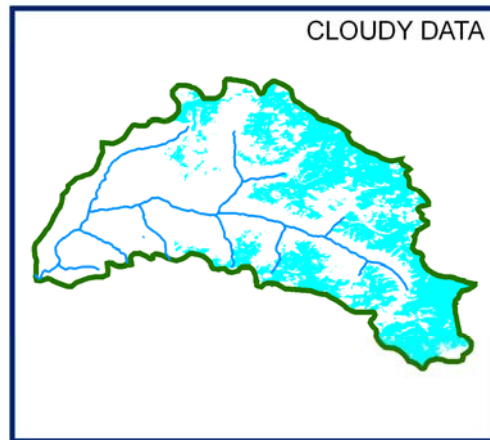
DATA NOT AVAILABLE



18 OCTOBER 2009



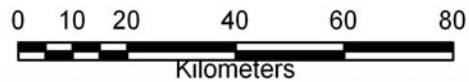
22 OCTOBER 2009



28 OCTOBER 2009

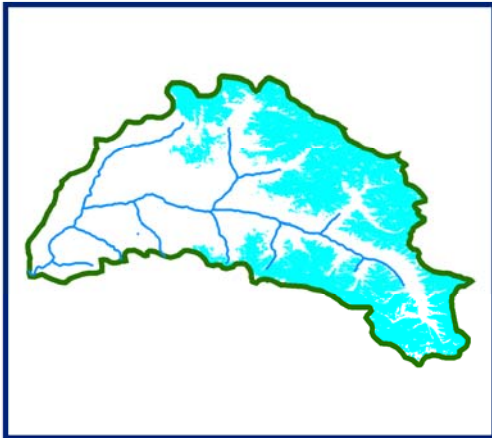


SNOW

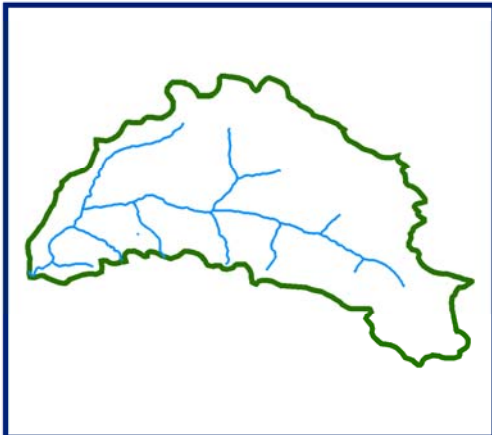


Kilometers

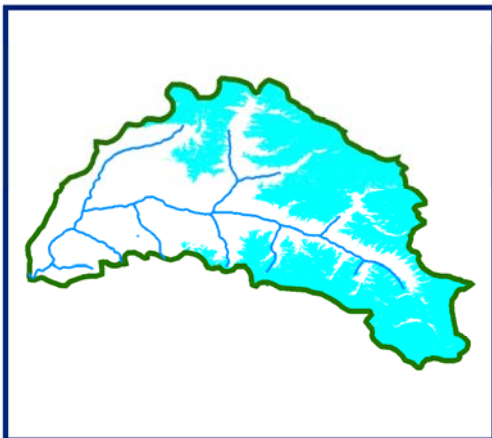
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
03 OCTOBER 2009



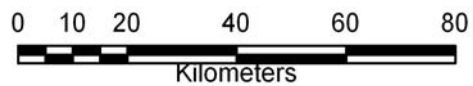
DATA USED
DATA NOT AVAILABLE



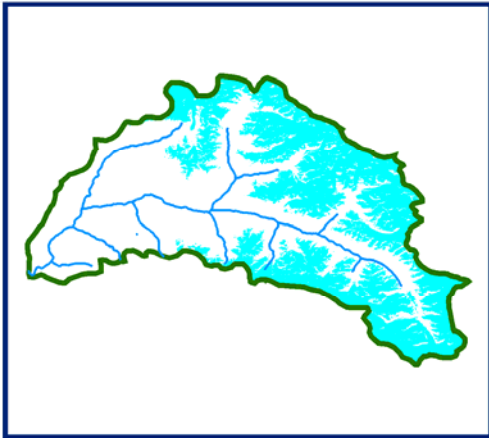
DATA USED
22 OCTOBER 2009



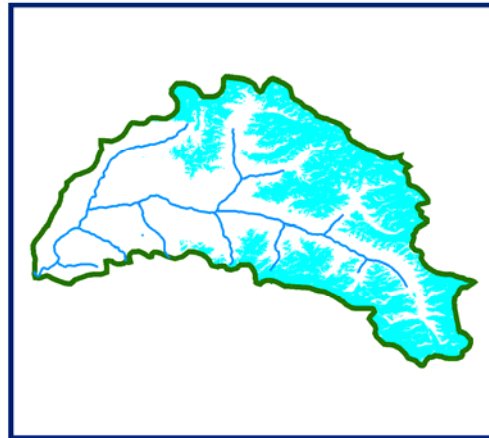
SNOW



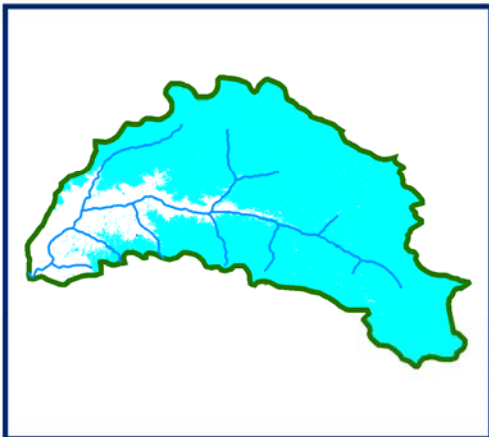
SNOW COVER MAP : PARBATI BASIN



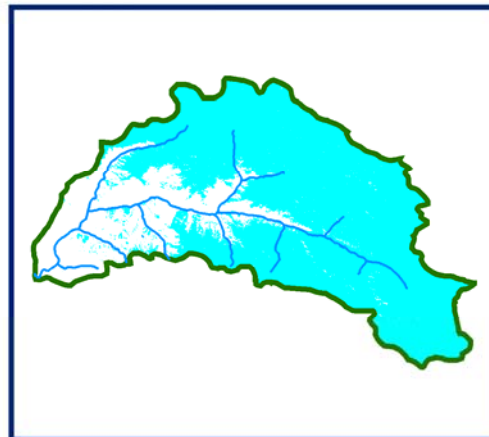
01 NOVEMBER 2009



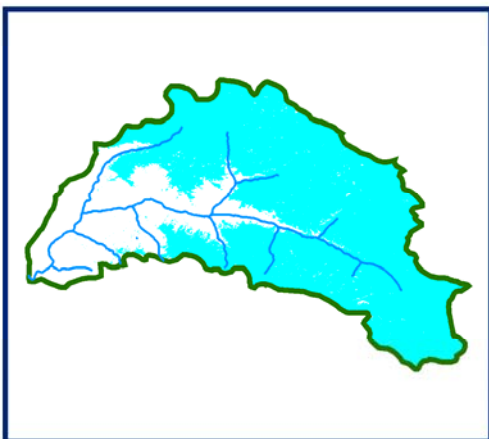
06 NOVEMBER 2009



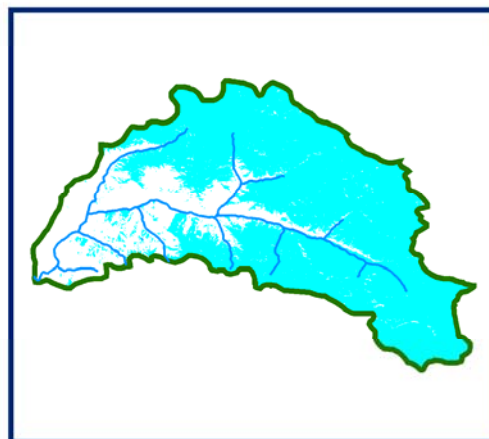
11 NOVEMBER 2009



20 NOVEMBER 2009



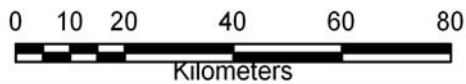
21 NOVEMBER 2009



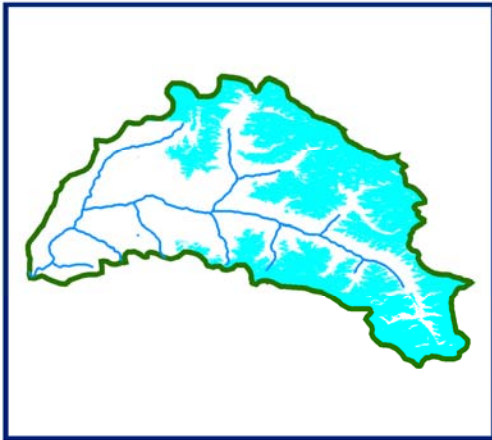
25 NOVEMBER 2009



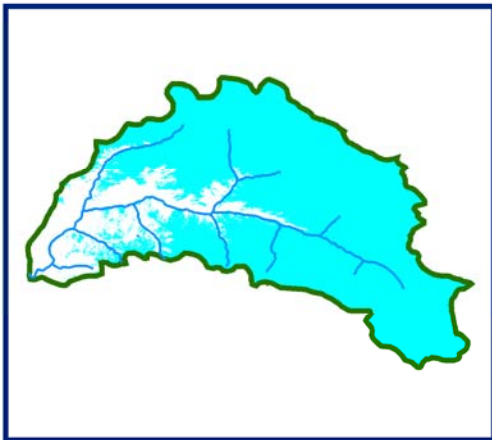
SNOW



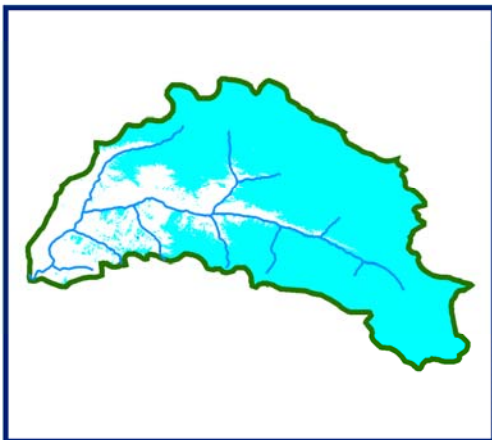
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
01 NOVEMBER 2009
06 NOVEMBER 2009



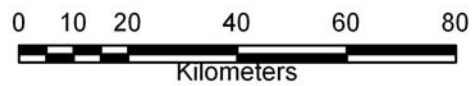
DATA USED
11 NOVEMBER 2009
20 NOVEMBER 2009



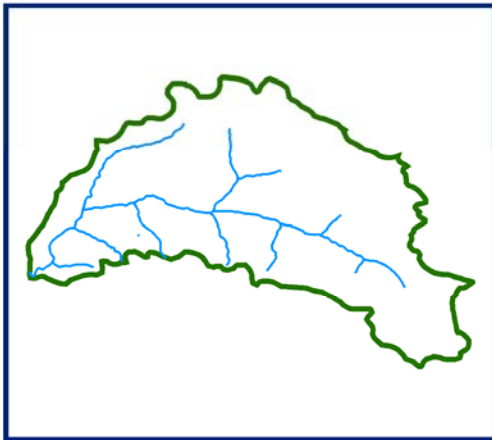
DATA USED
21 NOVEMBER 2009
25 NOVEMBER 2009



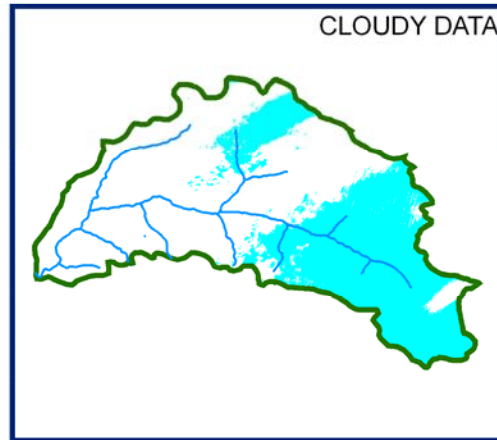
SNOW



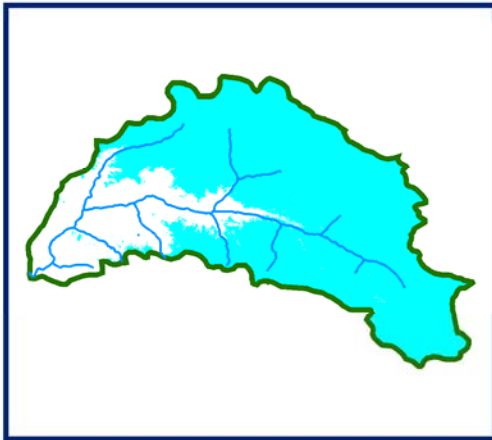
SNOW COVER MAP : PARBATI BASIN



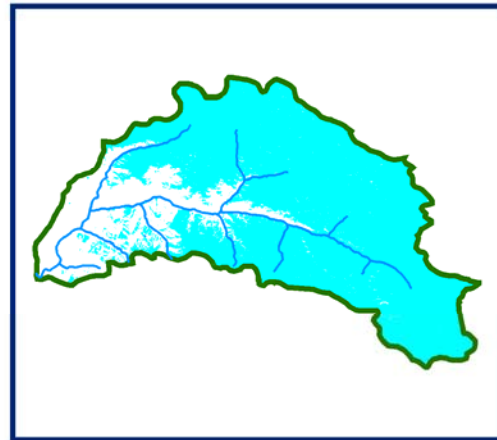
DATA NOT AVAILABLE



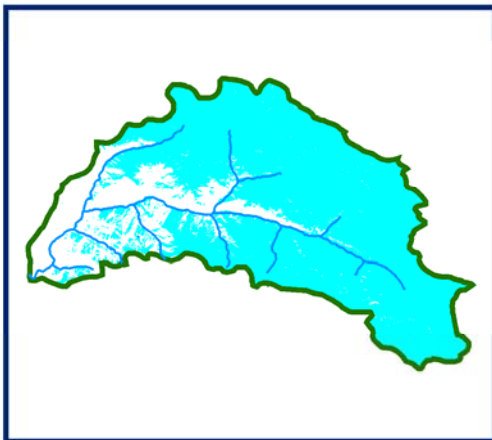
10 DECEMBER 2009



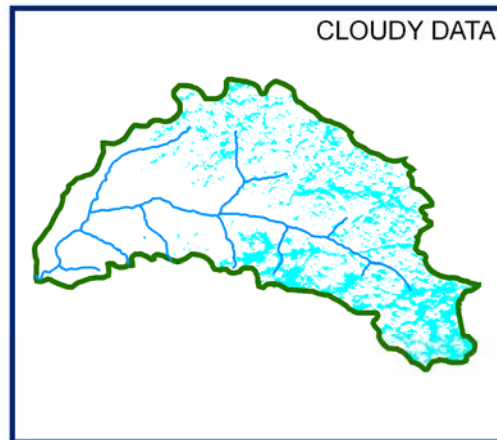
14 DECEMBER 2009



19 DECEMBER 2009



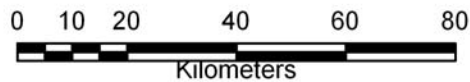
24 DECEMBER 2009



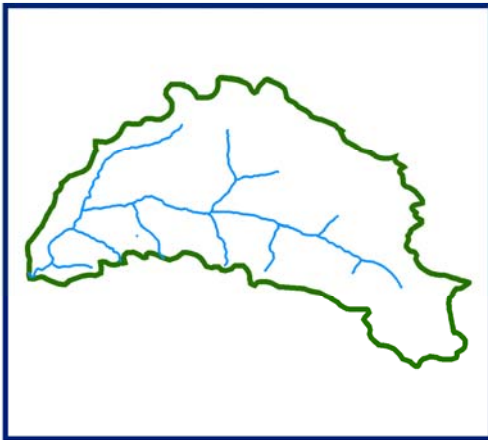
29 DECEMBER 2009



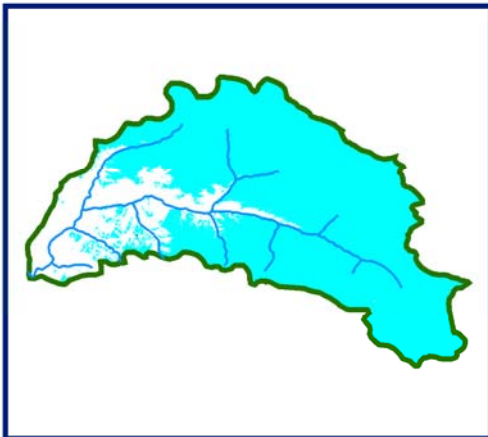
SNOW



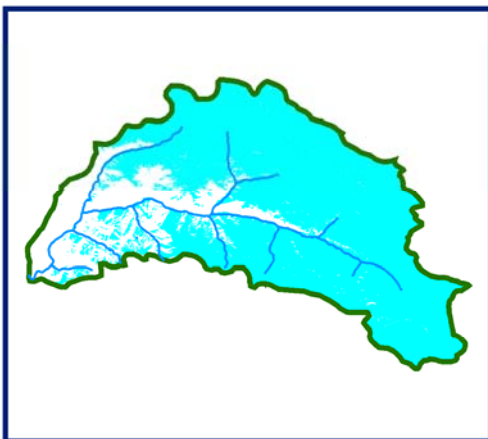
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
DATA NOT AVAILABLE



DATA USED
14 DECEMBER 2009
19 DECEMBER 2009



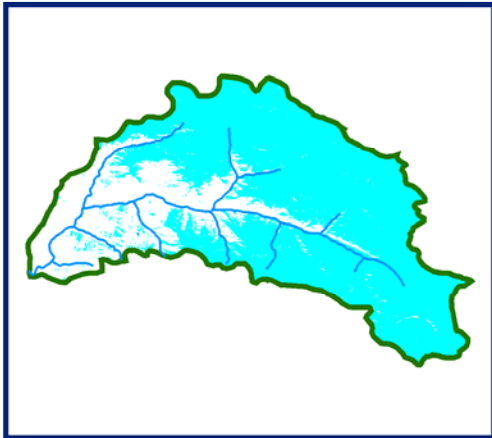
DATA USED
24 DECEMBER 2009



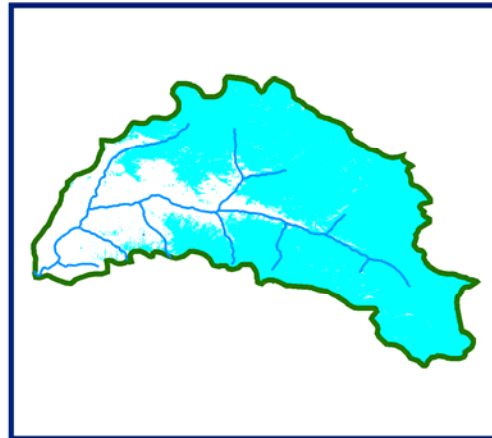
SNOW



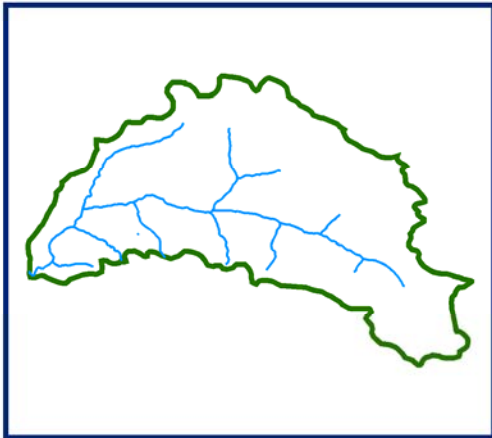
SNOW COVER MAP : PARBATI BASIN



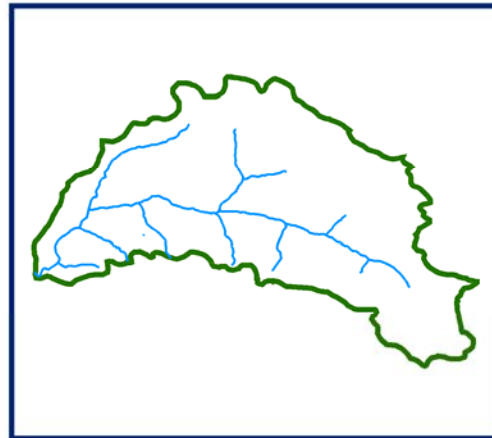
02 JANUARY 2010



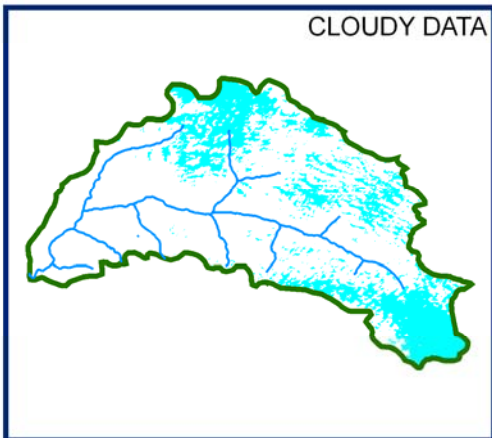
08 JANUARY 2010



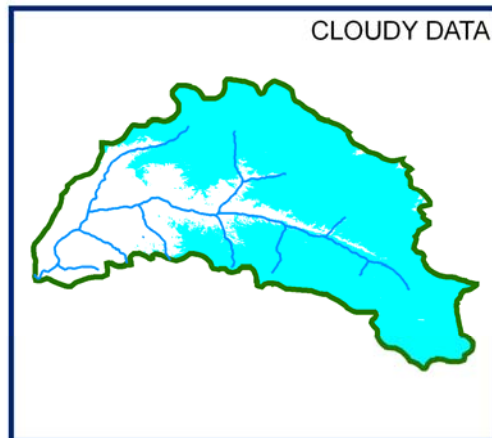
DATA NOT AVAILABLE



DATA NOT AVAILABLE



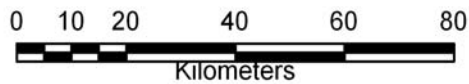
27 JANUARY 2010



31 JANUARY 2010

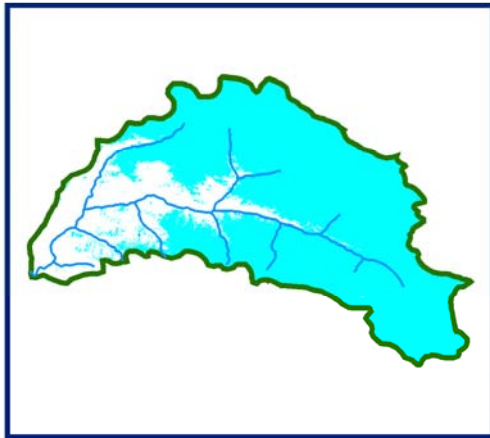


SNOW

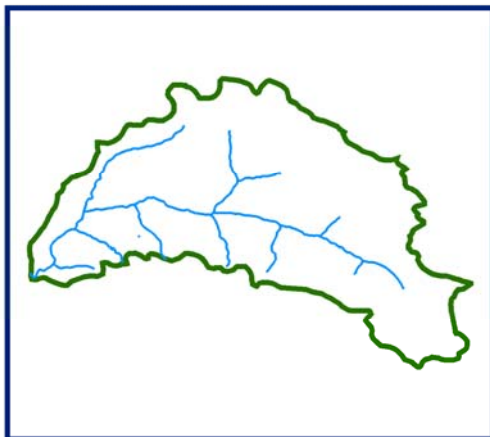


Kilometers

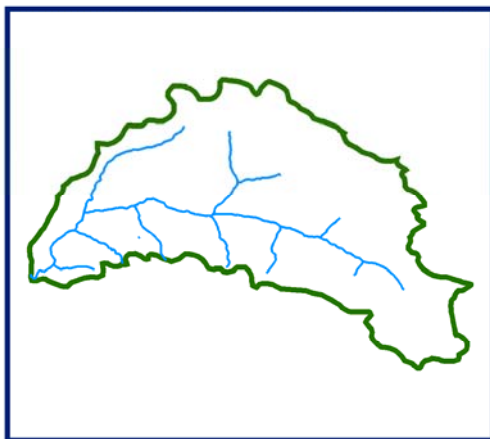
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
02 JANUARY 2010
08 JANUARY 2010



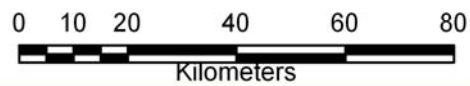
DATA USED
DATA NOT AVAILABLE



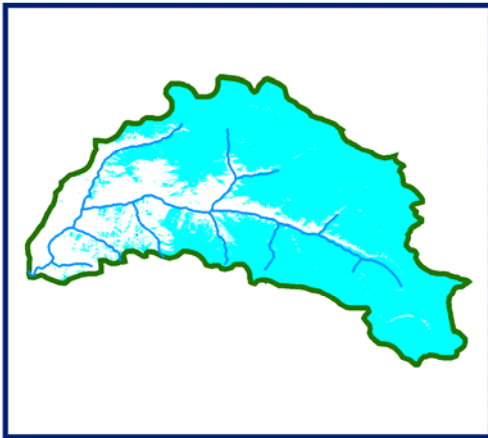
DATA USED
DATA NOT AVAILABLE



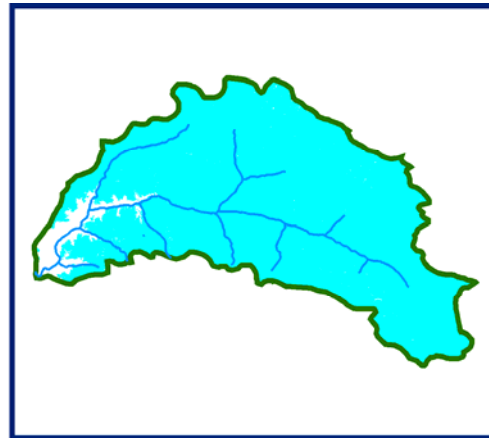
SNOW



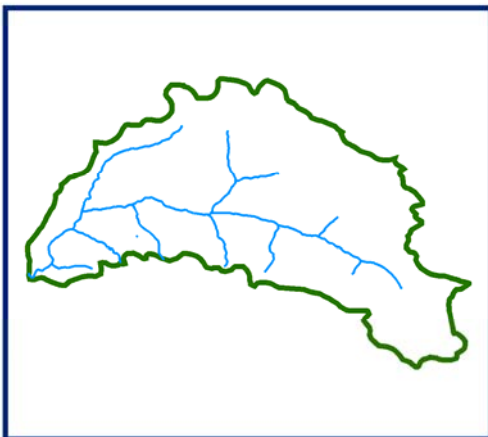
SNOW COVER MAP : PARBATI BASIN



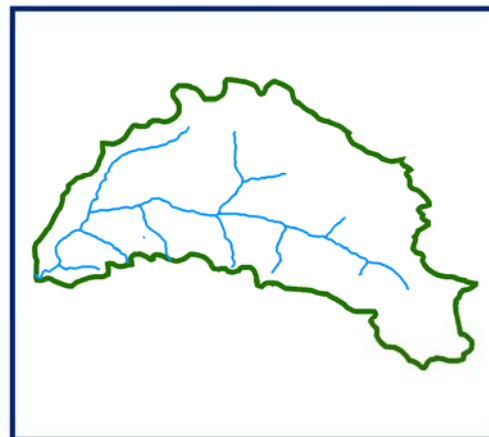
05 FEBRUARY 2010



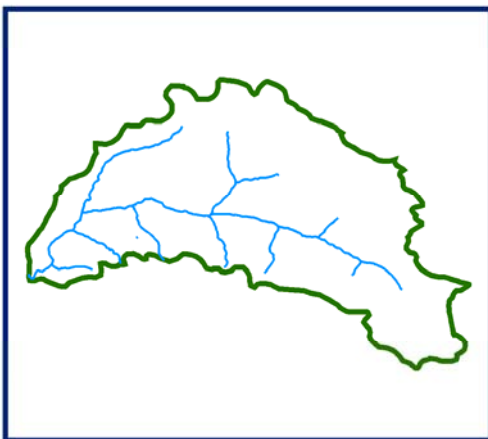
10 FEBRUARY 2010



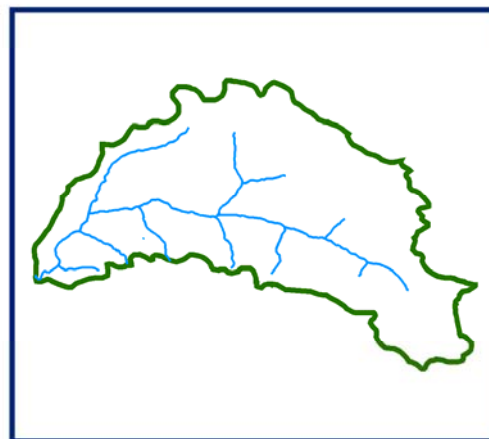
DATA NOT AVAILABLE



DATA NOT AVAILABLE



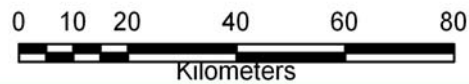
DATA NOT AVAILABLE



DATA NOT AVAILABLE

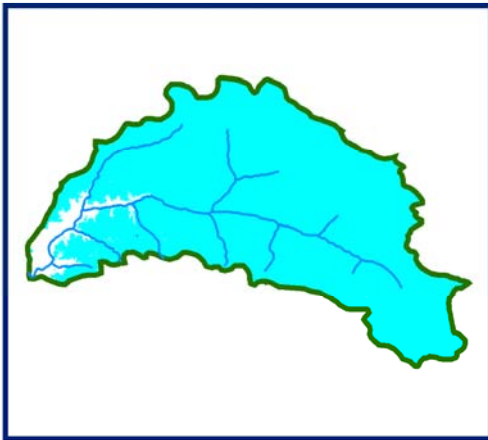


SNOW

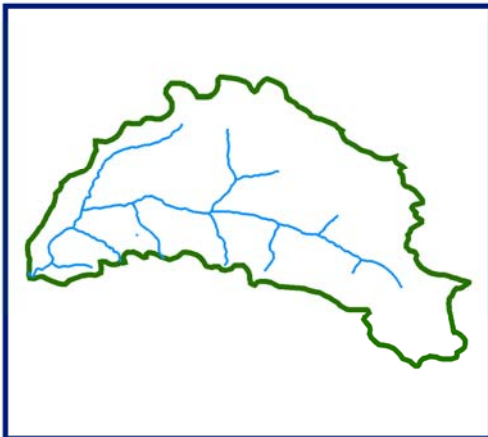


Kilometers

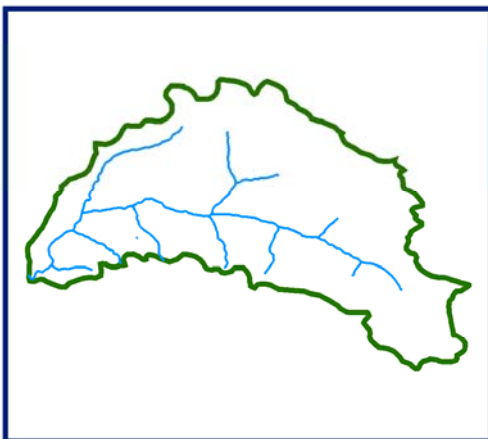
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
05 FEBRUARY 2010
10 FEBRUARY 2010



DATA USED
DATA NOT AVAILABLE



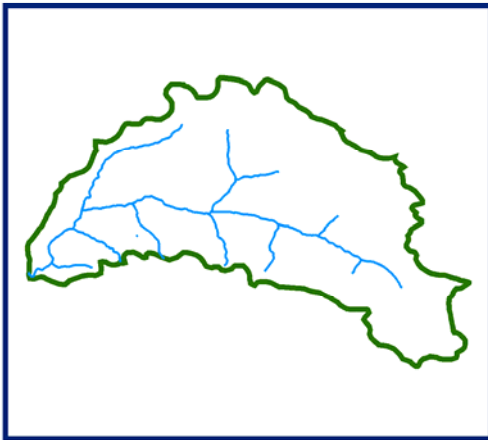
DATA USED
DATA NOT AVAILABLE



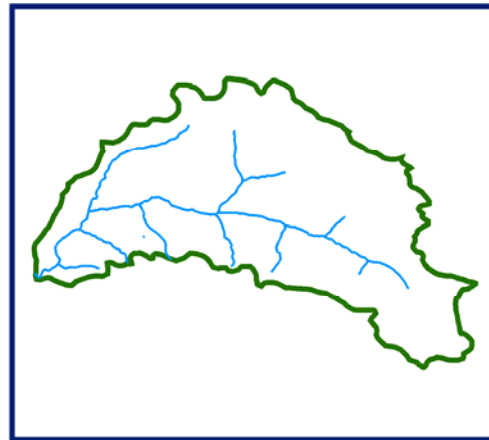
SNOW



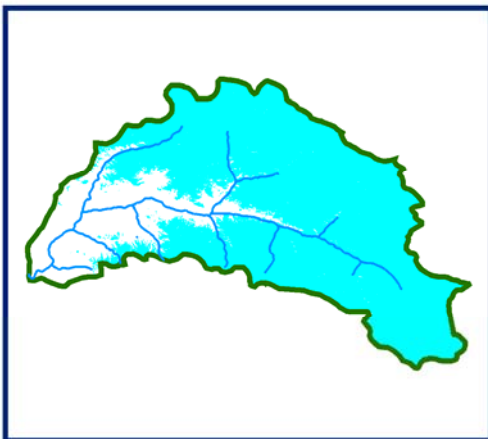
SNOW COVER MAP : PARBATI BASIN



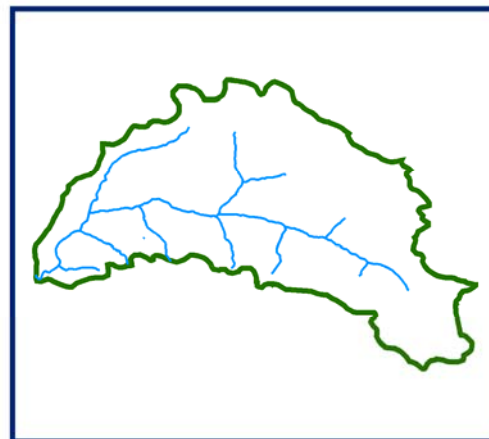
DATA NOT AVAILABLE



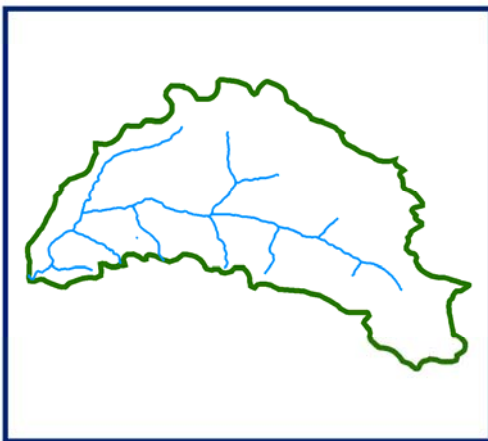
DATA NOT AVAILABLE



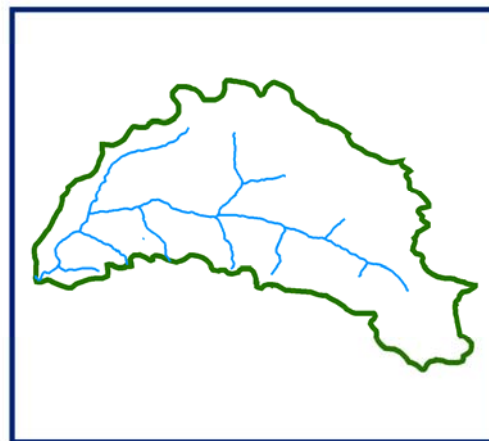
11 MARCH 2010



DATA NOT AVAILABLE



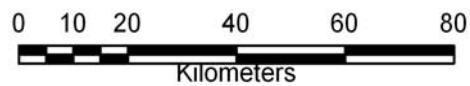
DATA NOT AVAILABLE



DATA NOT AVAILABLE

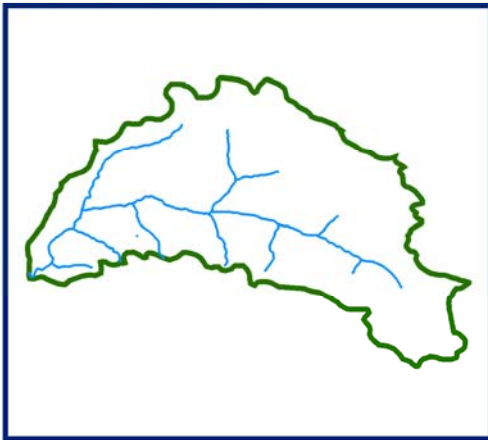


SNOW

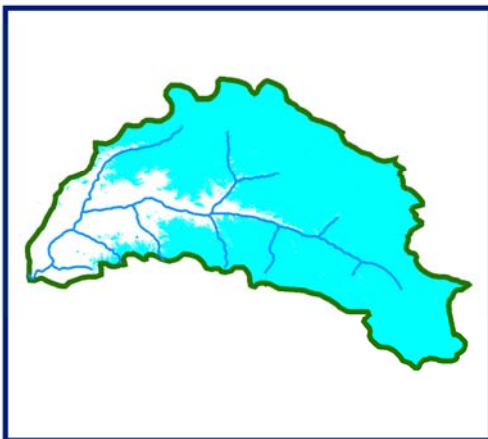


Kilometers

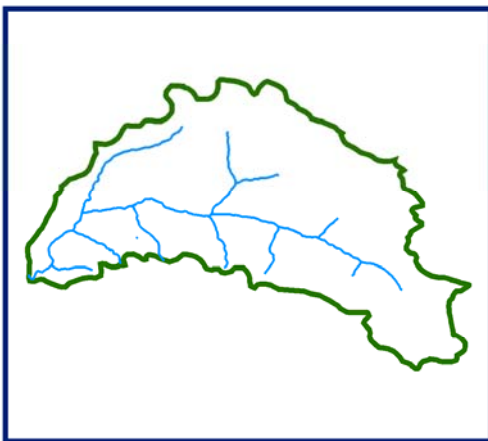
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
DATA NOT AVAILABLE



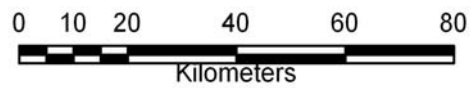
DATA USED
11 MARCH 2010



DATA USED
DATA NOT AVAILABLE

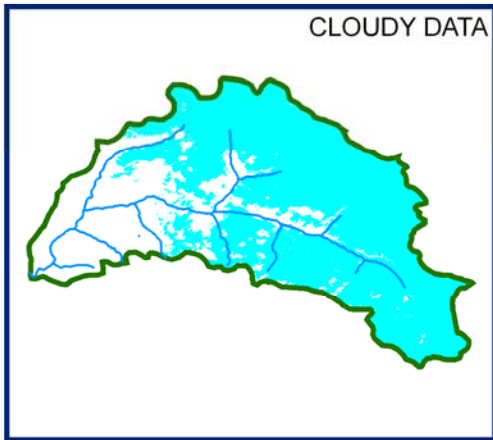


SNOW

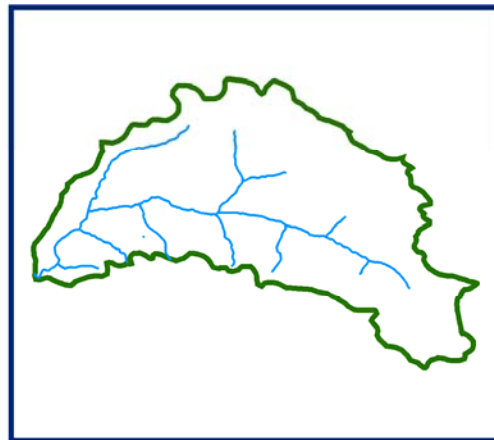


SNOW COVER MAP

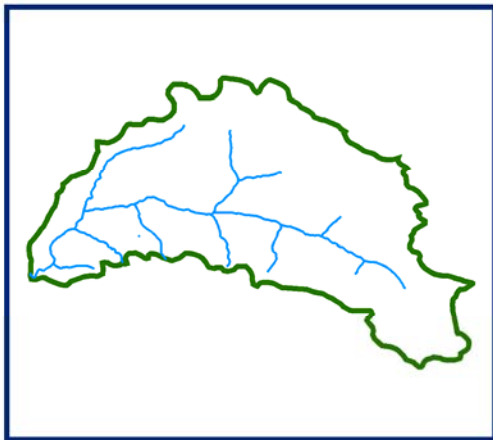
: PARBATI BASIN



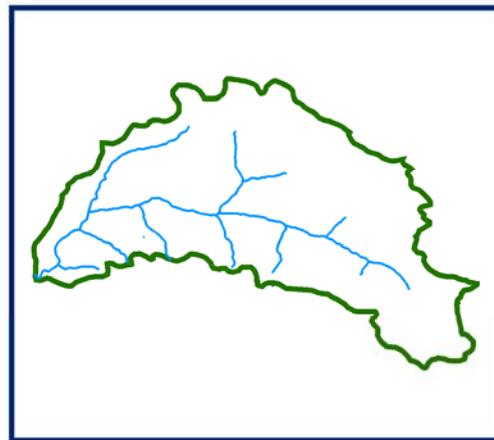
04 APRIL 2010



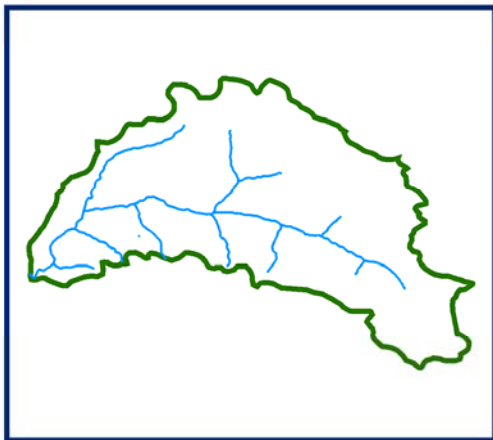
DATA NOT AVAILABLE



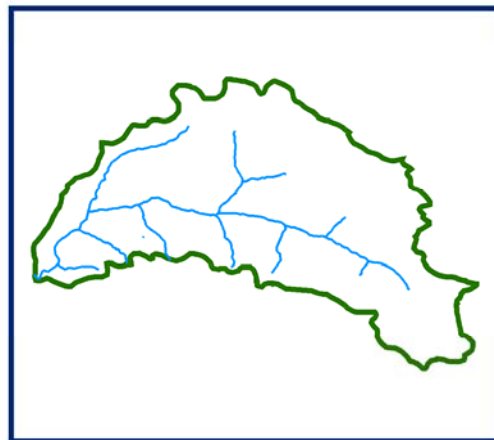
DATA NOT AVAILABLE



DATA NOT AVAILABLE



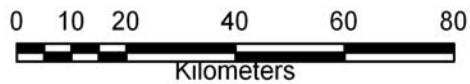
DATA NOT AVAILABLE



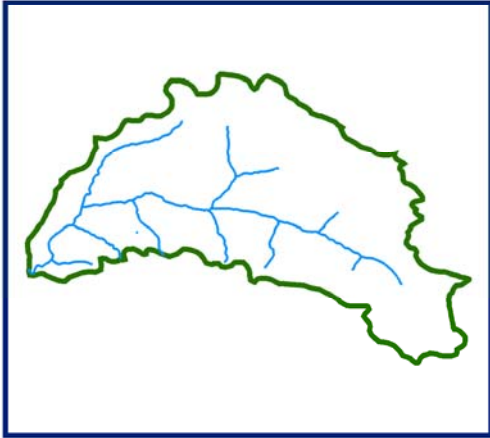
DATA NOT AVAILABLE



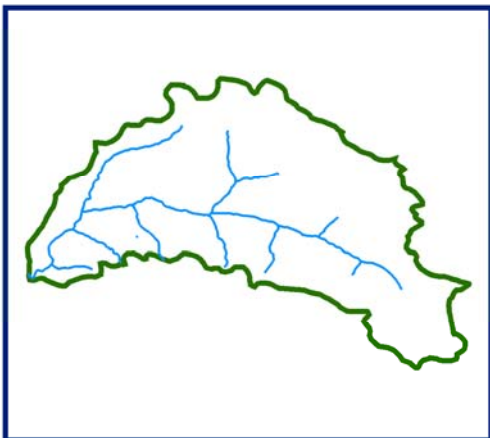
SNOW



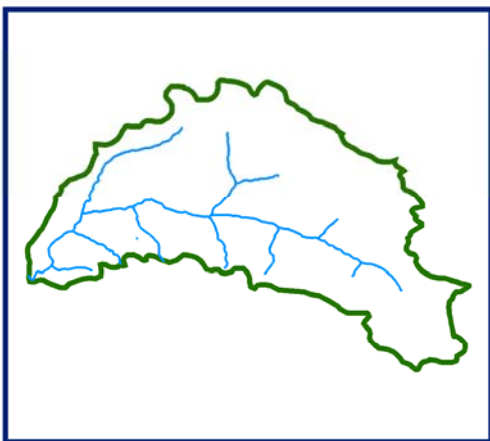
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
DATA NOT AVAILABLE



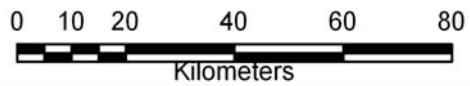
DATA USED
DATA NOT AVAILABLE



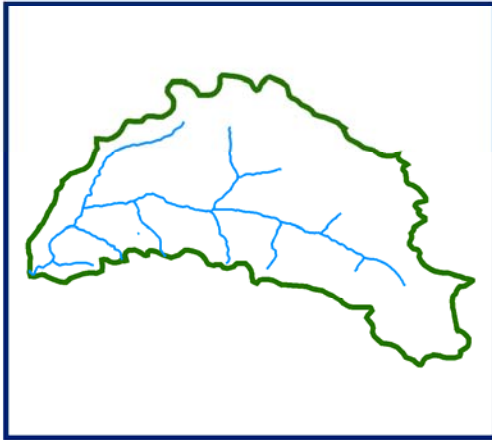
DATA USED
DATA NOT AVAILABLE



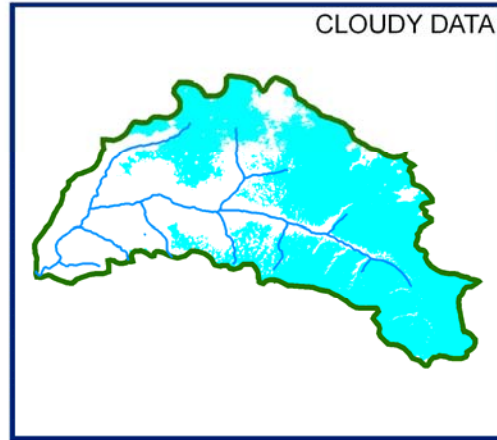
SNOW



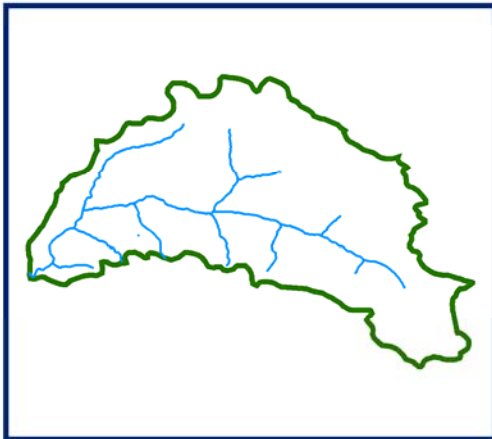
SNOW COVER MAP : PARBATI BASIN



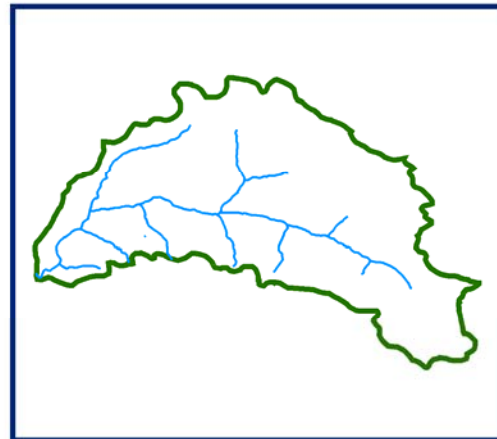
DATA NOT AVAILABLE



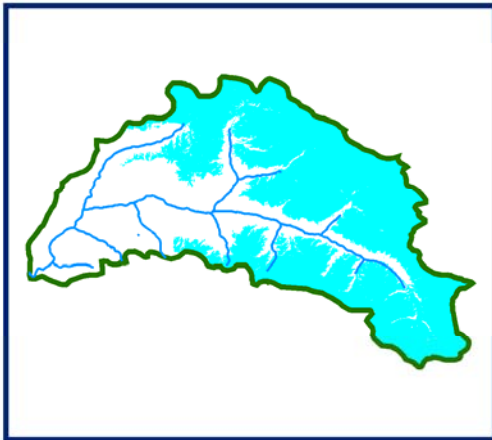
08 MAY 2010



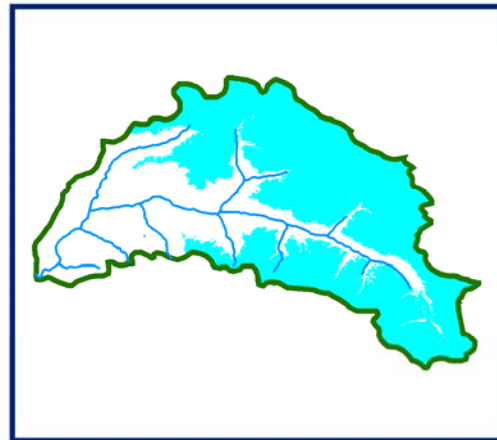
DATA NOT AVAILABLE



DATA NOT AVAILABLE



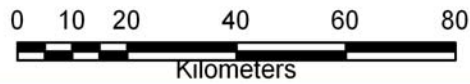
22 MAY 2010



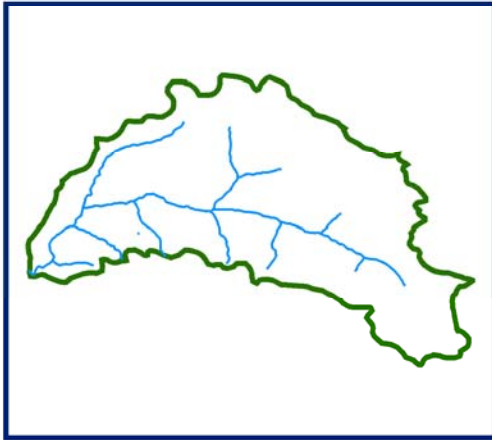
31 MAY 2010



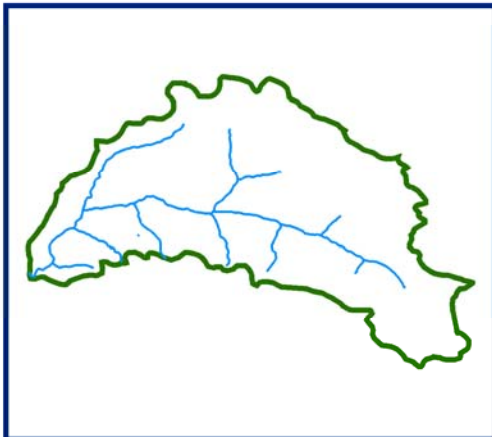
SNOW



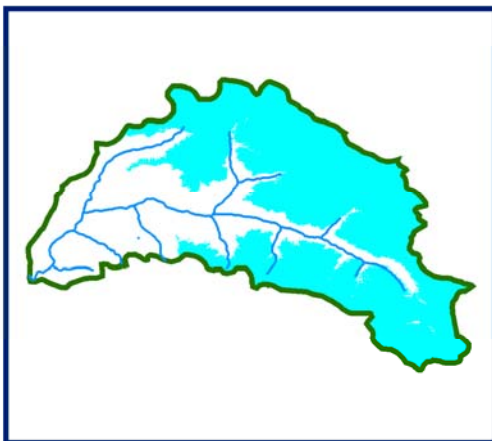
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
DATA NOT AVAILABLE



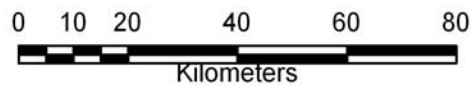
DATA USED
DATA NOT AVAILABLE



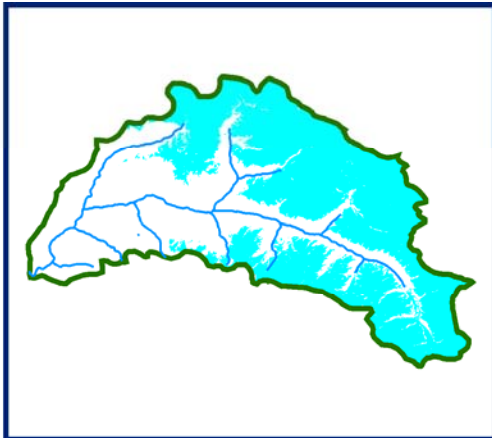
DATA USED
22 MAY 2010
26 MAY 2010
31 MAY 2010



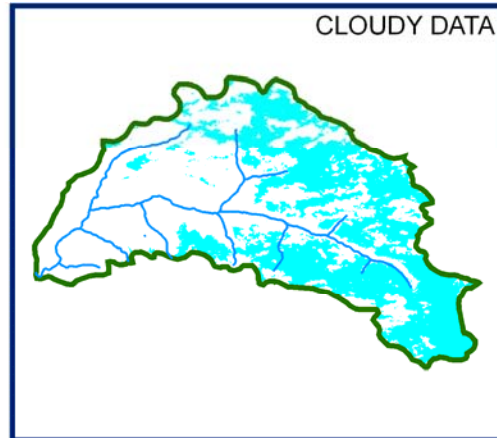
SNOW



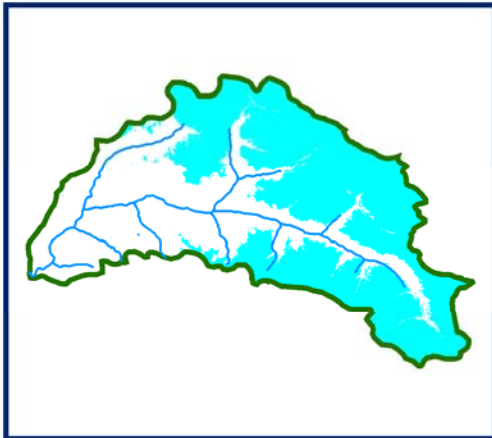
SNOW COVER MAP : PARBATI BASIN



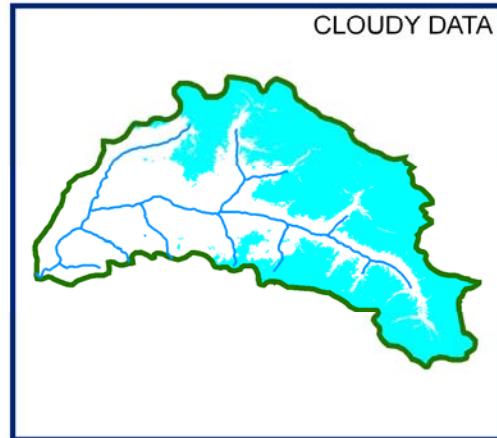
01 JUNE 2010



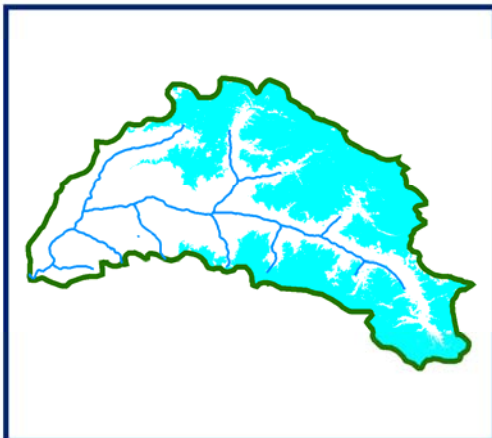
05 JUNE 2010



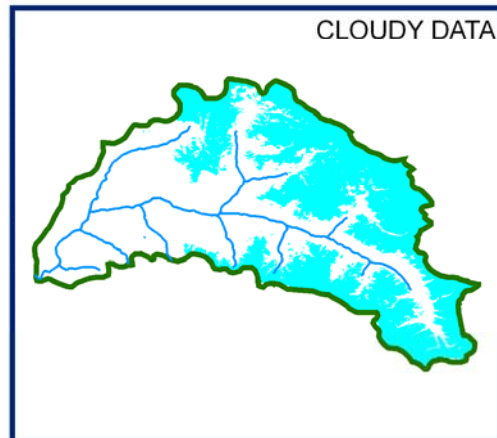
19 JUNE 2010



20 JUNE 2010



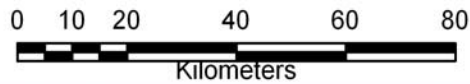
24 JUNE 2010



29 JUNE 2010

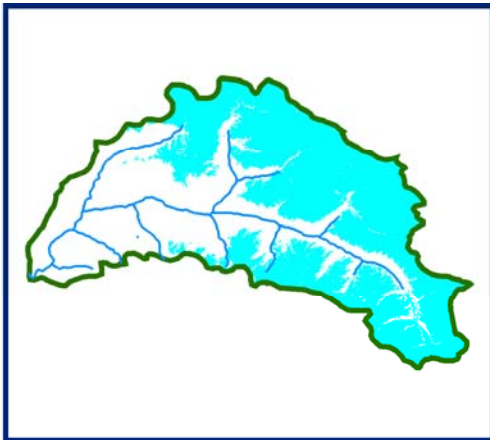


SNOW

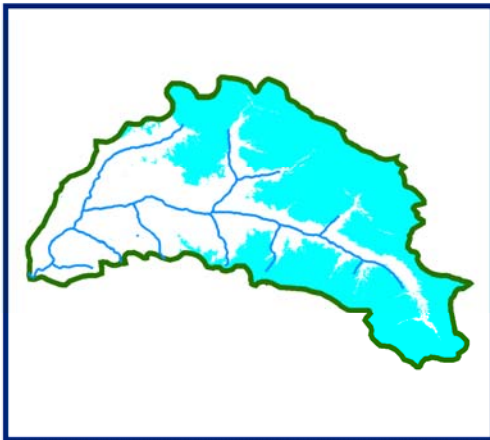


Kilometers

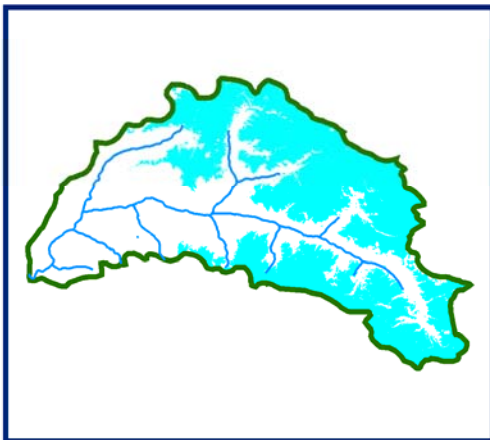
10 DAILY SNOW COVER MAP: PARBATI BASIN



DATA USED
01 JUNE 2010



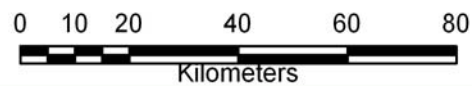
DATA USED
19 JUNE 2010



DATA USED
24 JUNE 2010



SNOW



BEAS BASIN

AREAL EXTENT OF SNOW (5 DAILY)

BASIN NAME: BEAS

BASIN AREA: 1132 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009							
1	3-Oct-09	41.9	4	2	4-Oct-09	6.2	1
3	8-Oct-09	280.0	25	4	18-Oct-09	586.0	52
5	22-Oct-09	160.0	14	6	27-Oct-09	124.2	11
7	28-Oct-09	57.8	5				
November 2009							
8	1-Nov-09	108.6	10	9	6-Nov-09	93.5	8
10	11-Nov-09	895.9	79	11	20-Nov-09	682.6	60
12	21-Nov-09	609.8	54	13	25-Nov-09	631.6	56
14	30-Nov-09	516.5	46				
December 2009							
15	10-Dec-09	209.8	19	16	14-Dec-09	710.5	63
17	19-Dec-09	672.3	59	18	24-Dec-09	602.3	53
19	29-Dec-09	79.3	7				
January 2010							
20	2-Jan-10	589.0	52	21	8-Jan-10	559.4	49
22	27-Jan-10	372.6	33	23	31-Jan-10	443.8	39
February 2010							
24	5-Feb-10	584.1	52	25	10-Feb-10	1104.0	98
March 2010							
26	11-Mar-10	703.9	62				
April 2010							
27	4-Apr-10	597.7	53				
May 2010							
28	8-May-10	269.5	24	29	22-May-10	241.3	21
30	26-May-10	233.1	21	31	31-May-10	310.5	27
June 2010							
32	1-Jun-10	195.7	17	33	5-Jun-10	122.6	11
34	19-Jun-10	259.3	23	35	20-Jun-10	218.4	19
36	24-Jun-10	105.0	9	37	29-Jun-10	35.8	3
July 2010							
38	14-Jul-10	68.3	6				

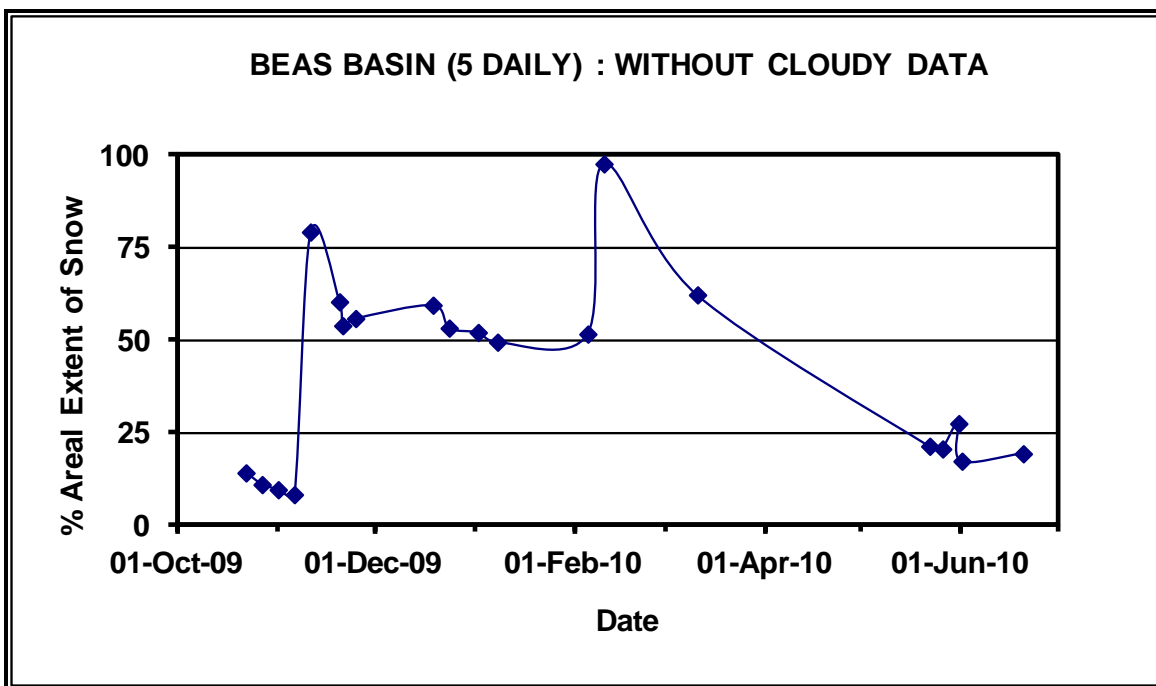
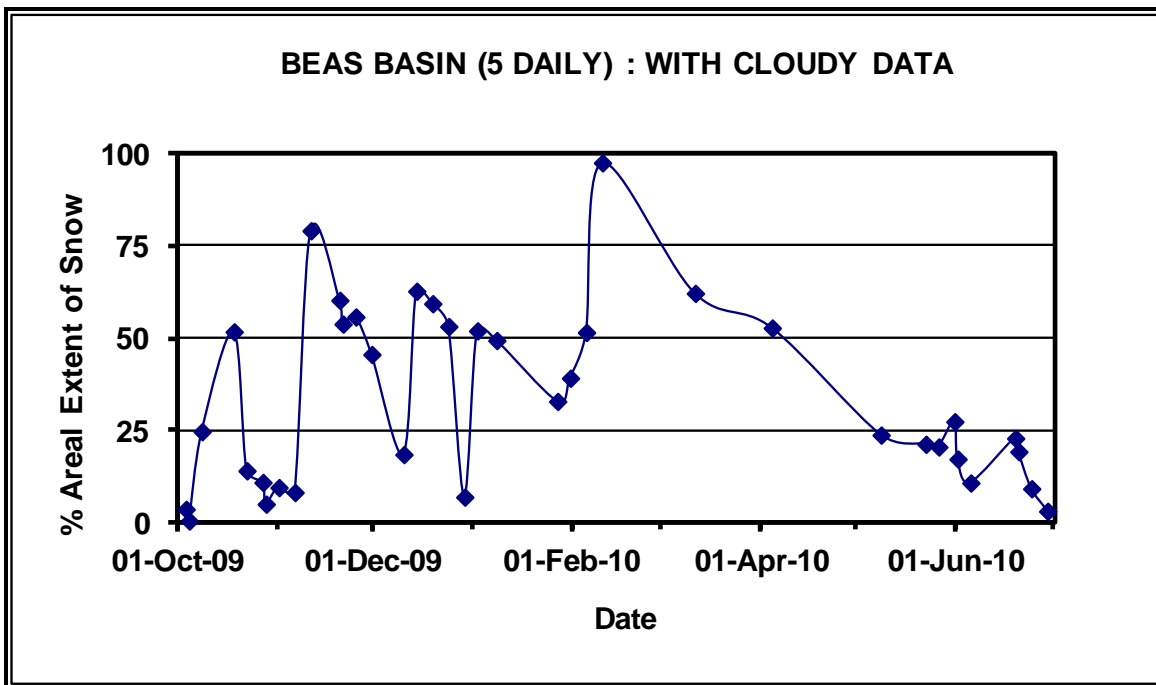
AREAL EXTENT OF SNOW (10 DAILY)

BASIN NAME: BEAS

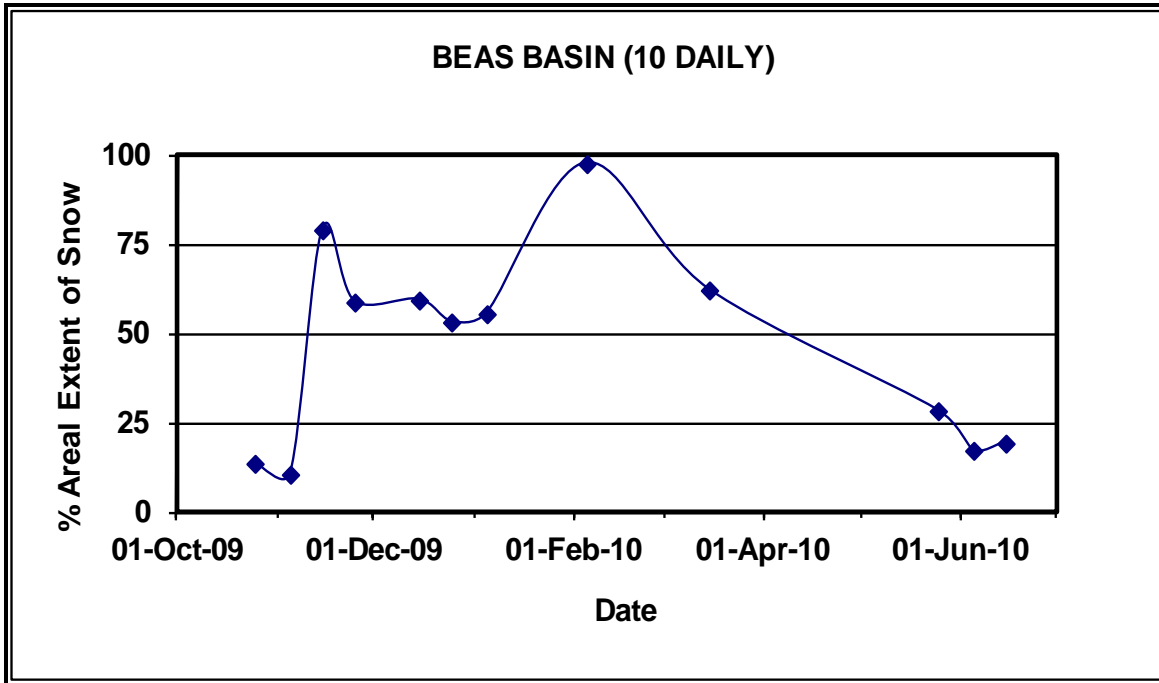
BASIN AREA: 1132 sq km

S No	Date	Snow cover (sq km)	Snow cover (%)	S No	Date	Snow cover (sq km)	Snow cover (%)
October 2009				November 2009			
1	22-Oct-09	154.5	14	2	1-Nov-09	119.9	11
				3	11-Nov-09	781.3	69
				4	21-Nov-09	665.5	59
December 2009				January 2010			
5	19-Dec-09	671.9	59	7	2-Jan-10	628.5	56
6	24-Dec-09	602.3	53				
February 2010				March 2010			
8	5-Feb-10	1104.2	98	9	11-Mar-10	703.9	62
April 2010				May 2010			
				10	26-May-10	321.3	28
June 2010				July 2010			
11	1-Jun-10	195.7	17				
12	20-Jun-10	218.4	19				

Snow cover depletion curve

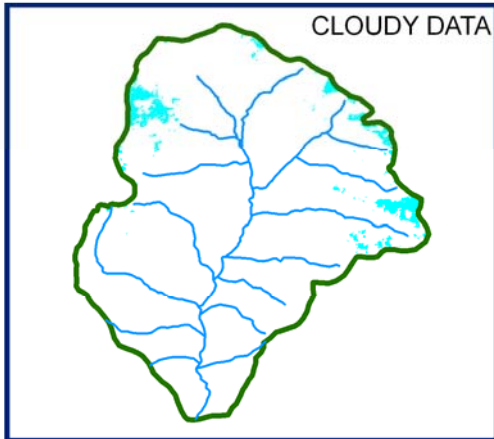


Snow cover depletion curve

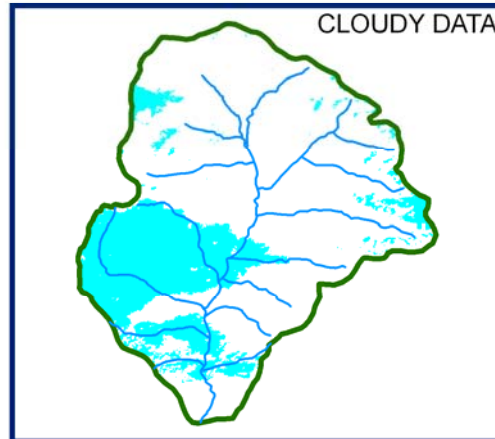


SNOW COVER MAP

SNOW COVER MAP : BEAS BASIN



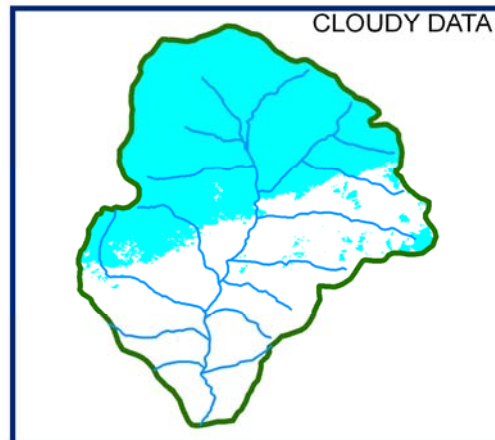
03 OCTOBER 2009



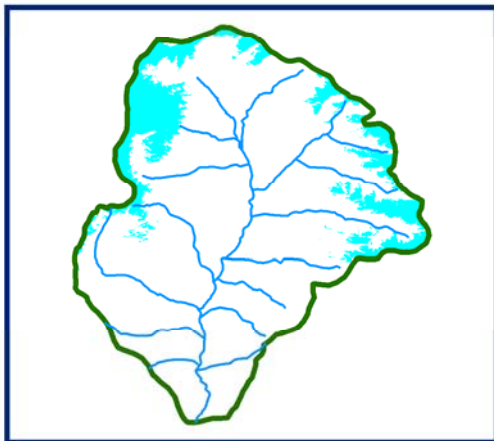
08 OCTOBER 2009



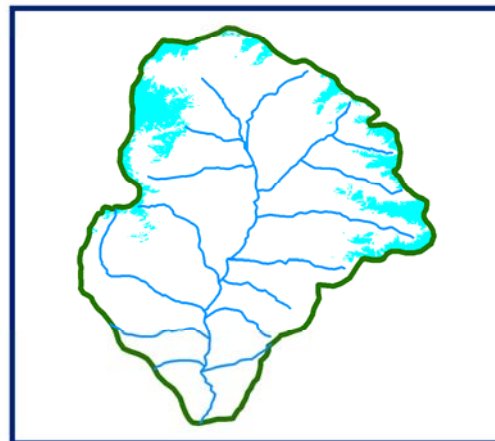
DATA NOT AVAILABLE



18 OCTOBER 2009



22 OCTOBER 2009



27 OCTOBER 2009

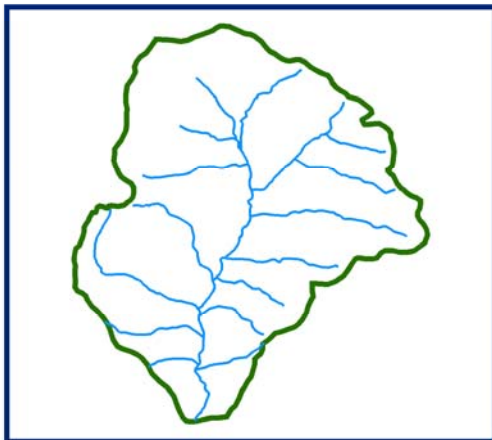
 SNOW



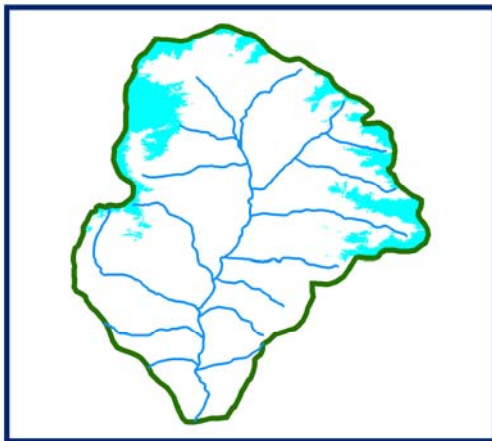
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
DATA NOT AVAILABLE

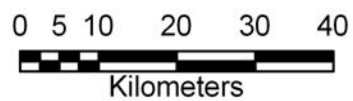


DATA USED
DATA NOT AVAILABLE

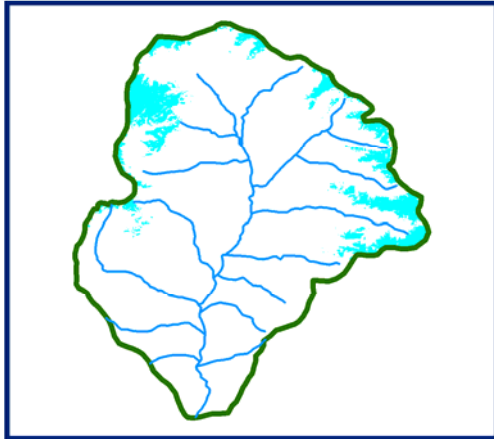


DATA USED
22 OCTOBER 2009
27 OCTOBER 2009

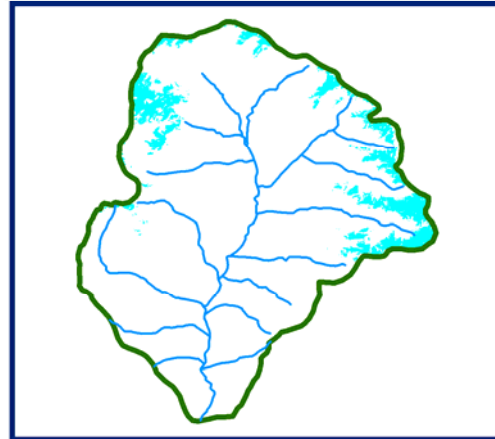
 SNOW



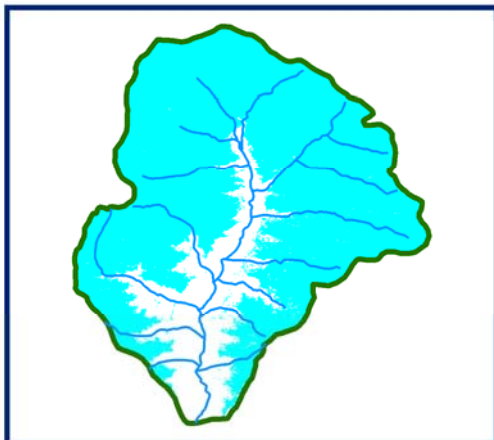
SNOW COVER MAP : BEAS BASIN



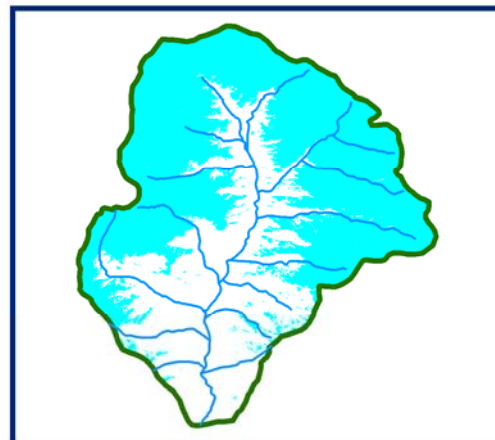
01 NOVEMBER 2009



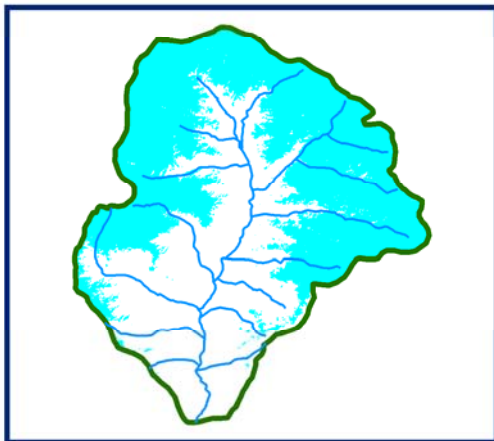
06 NOVEMBER 2009



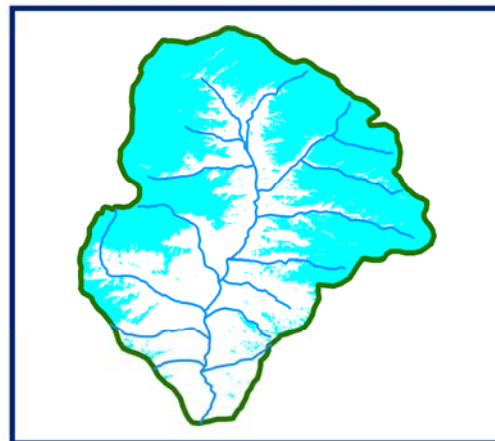
11 NOVEMBER 2009



20 NOVEMBER 2009



21 NOVEMBER 2009

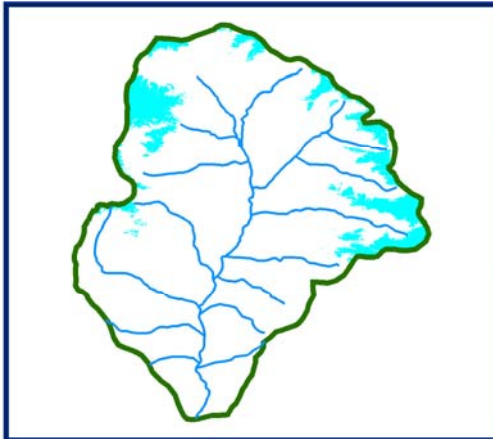


25 NOVEMBER 2009

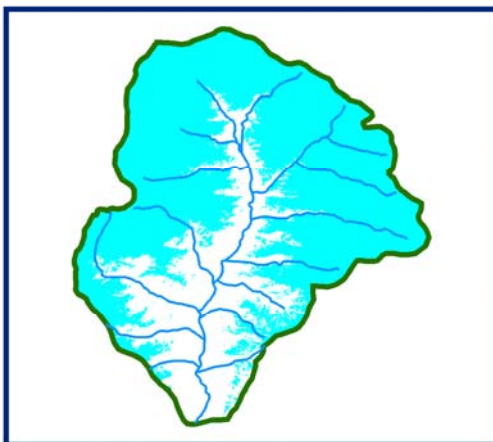
 SNOW



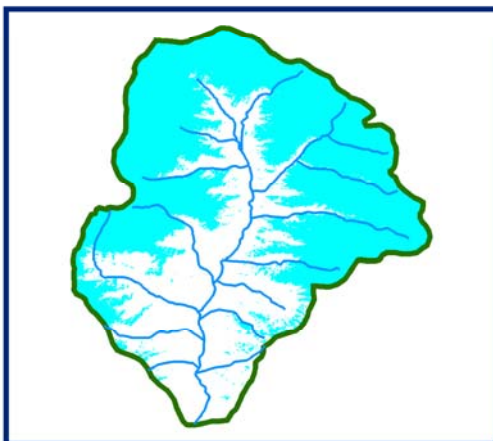
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
01 NOVEMBER 2009
06 NOVEMBER 2009



DATA USED
11 NOVEMBER 2009
20 NOVEMBER 2009



DATA USED
21 NOVEMBER 2009
25 NOVEMBER 2009

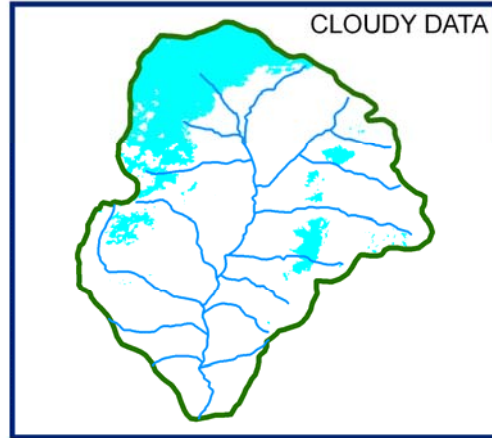
 SNOW



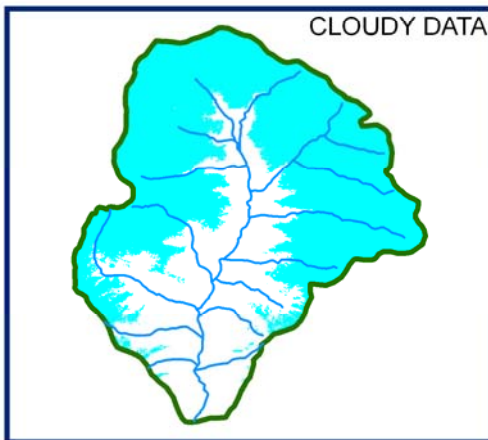
SNOW COVER MAP : BEAS BASIN



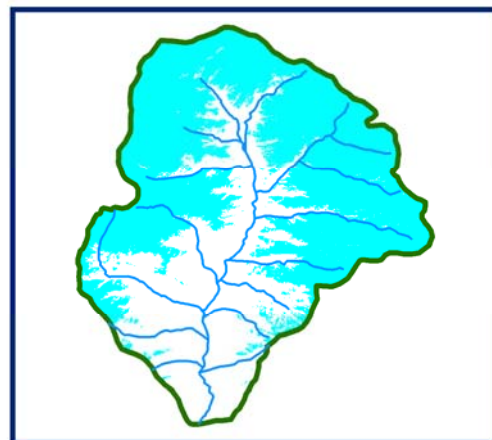
DATA NOT AVAILABLE



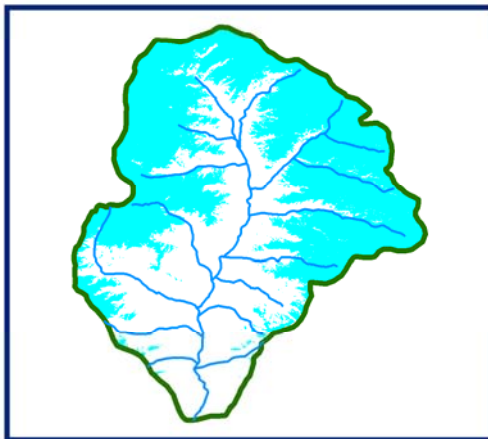
10 DECEMBER 2009



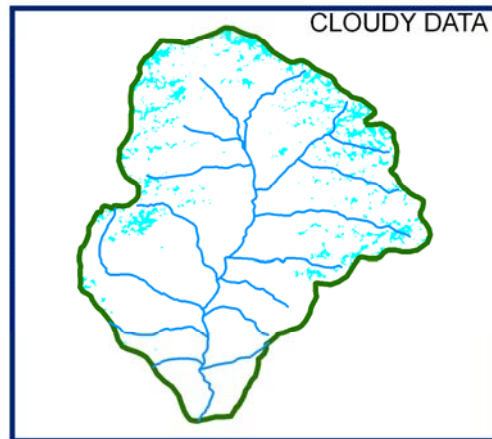
14 DECEMBER 2009



19 DECEMBER 2009

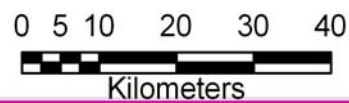


24 DECEMBER 2009

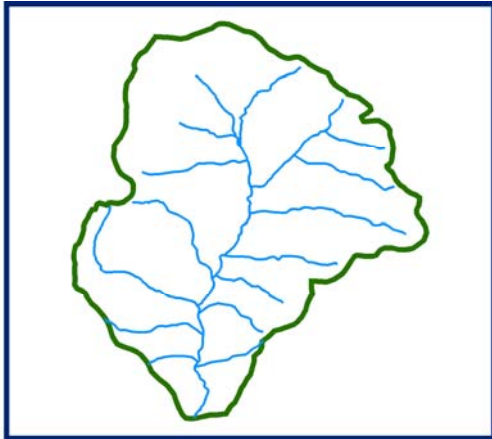


29 DECEMBER 2009

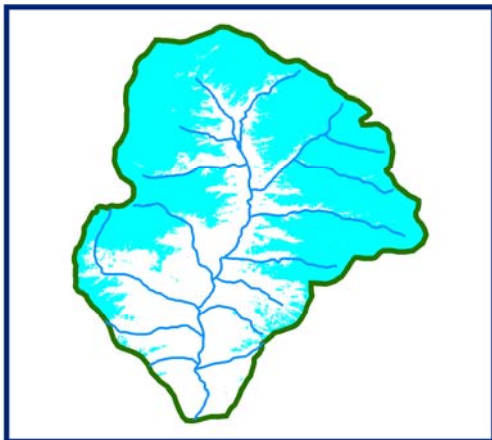
 SNOW



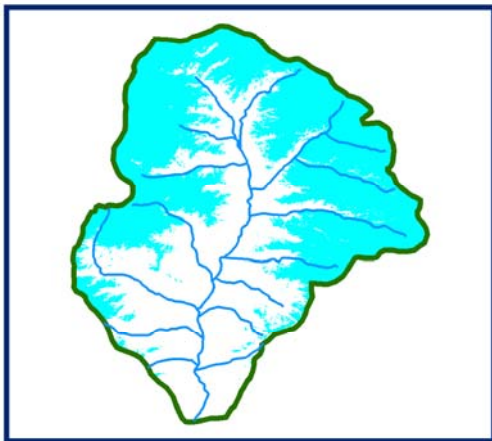
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
DATA NOT AVAILABLE

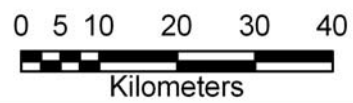


DATA USED
19 DECEMBER 2009

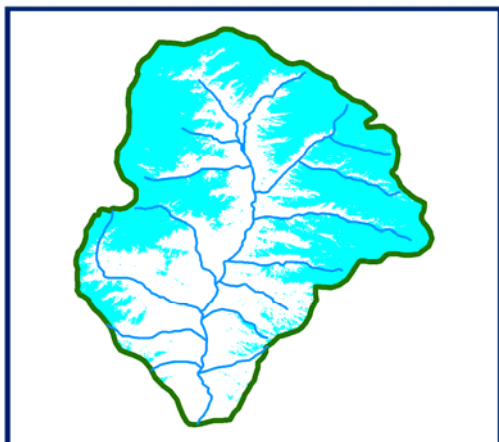


DATA USED
24 DECEMBER 2009

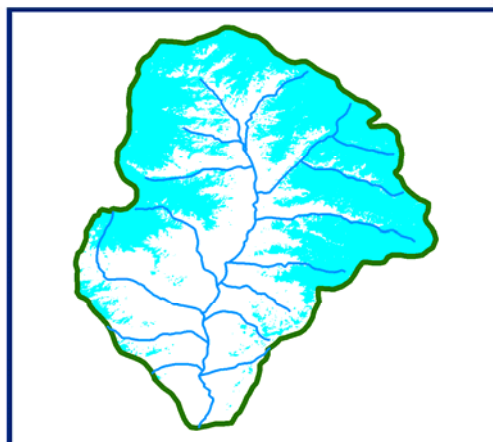
 SNOW



SNOW COVER MAP : BEAS BASIN



02 JANUARY 2010



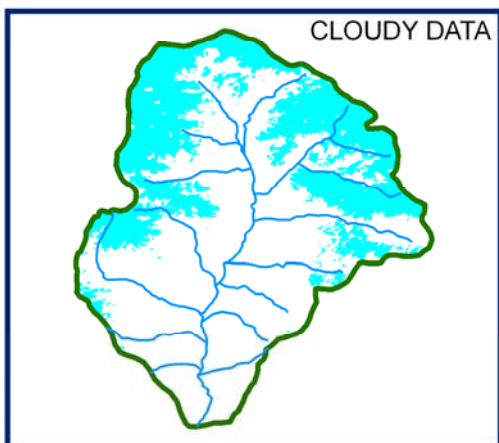
08 JANUARY 2010



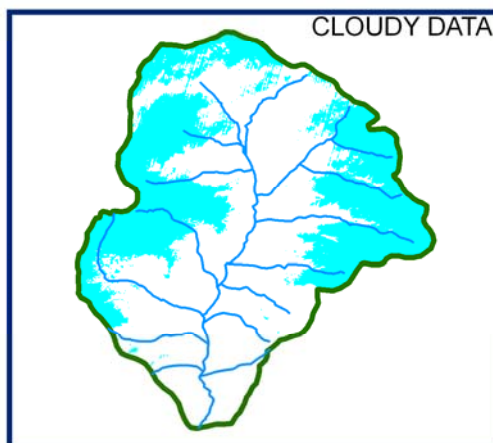
DATA NOT AVAILABLE



DATA NOT AVAILABLE



27 JANUARY 2010



31 JANUARY 2010

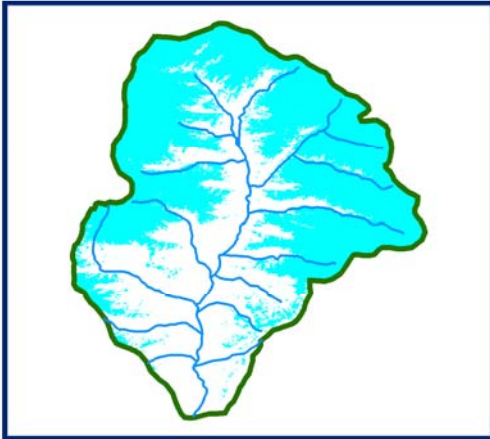


0 5 10 20 30 40



Kilometers

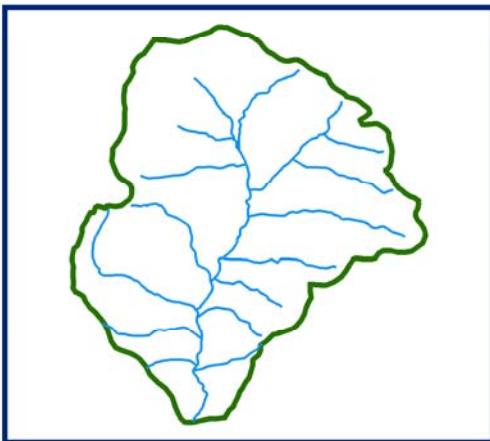
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
02 JANUARY 2010
08 JANUARY 2010

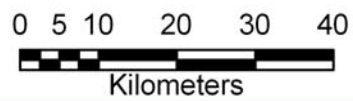


DATA USED
DATA NOT AVAILABLE

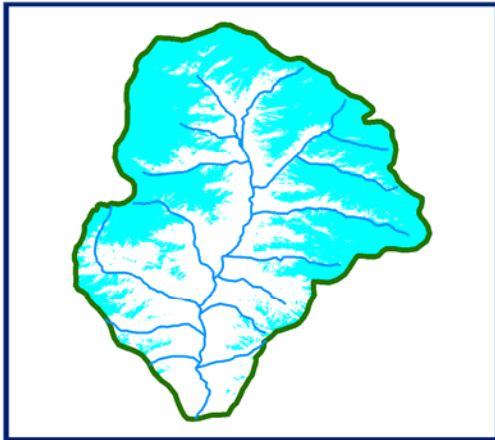


DATA USED
DATA NOT AVAILABLE

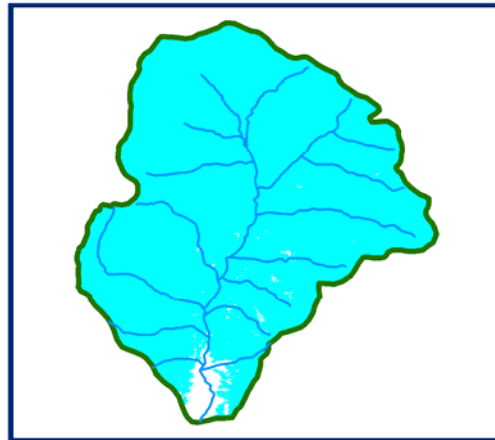
 SNOW



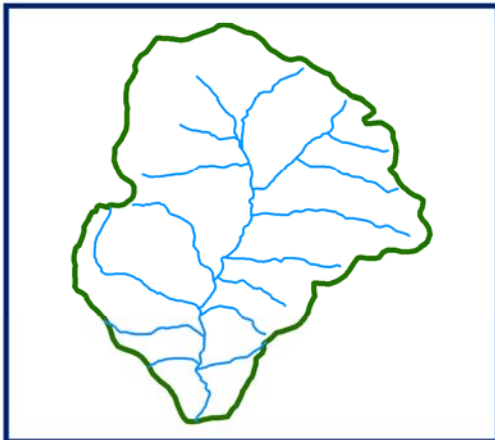
SNOW COVER MAP : BEAS BASIN



05 FEBRUARY 2010



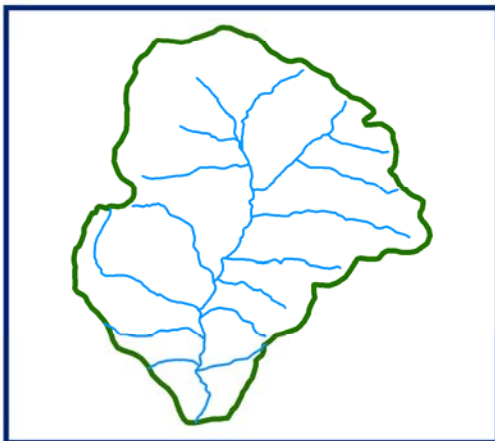
10 FEBRUARY 2010



DATA NOT AVAILABLE



DATA NOT AVAILABLE

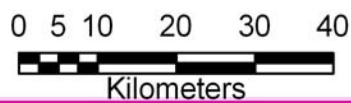


DATA NOT AVAILABLE



DATA NOT AVAILABLE

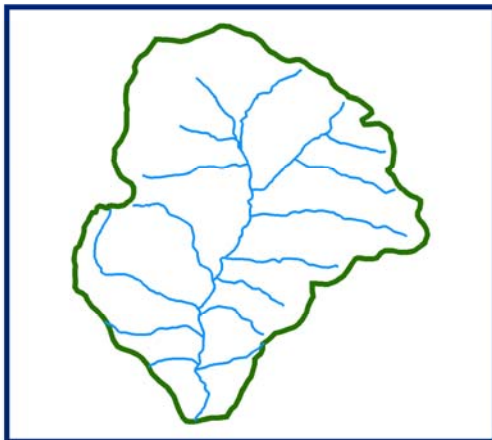
 SNOW



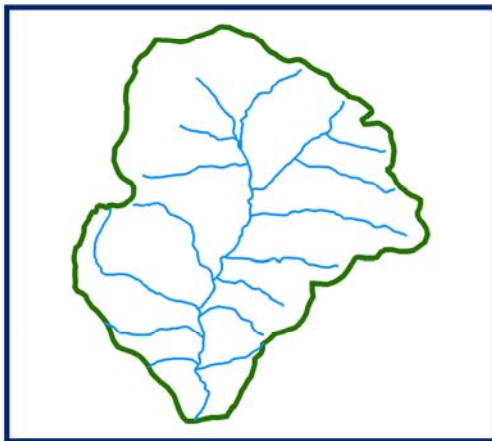
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
05 FEBRUARY 2010
10 FEBRUARY 2010

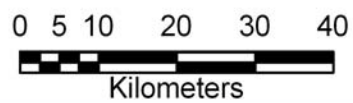


DATA USED
DATA NOT AVAILABLE

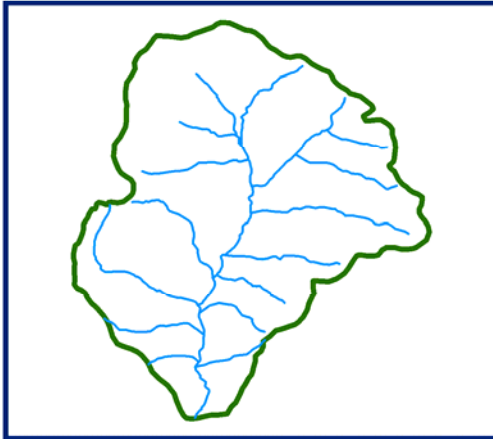


DATA USED
DATA NOT AVAILABLE

 SNOW



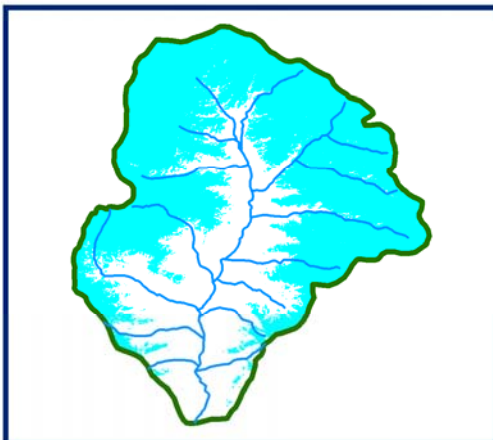
SNOW COVER MAP : BEAS BASIN



DATA NOT AVAILABLE



DATA NOT AVAILABLE



11 MARCH 2010



DATA NOT AVAILABLE

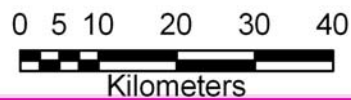


DATA NOT AVAILABLE



DATA NOT AVAILABLE

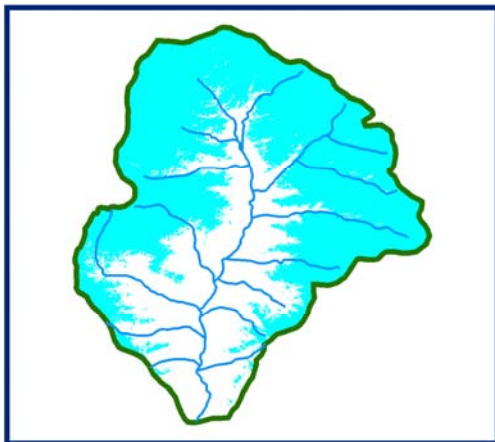
 SNOW



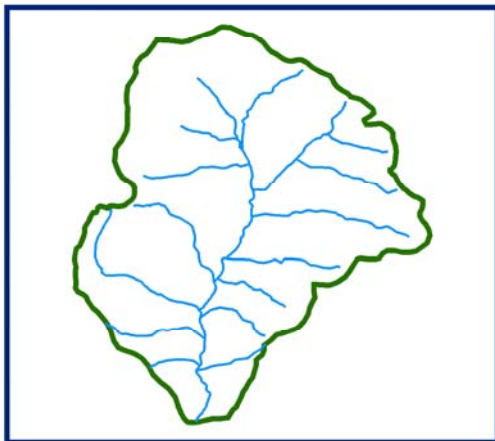
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
DATA NOT AVAILABLE

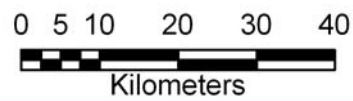


DATA USED
11 MARCH 2010



DATA USED
DATA NOT AVAILABLE

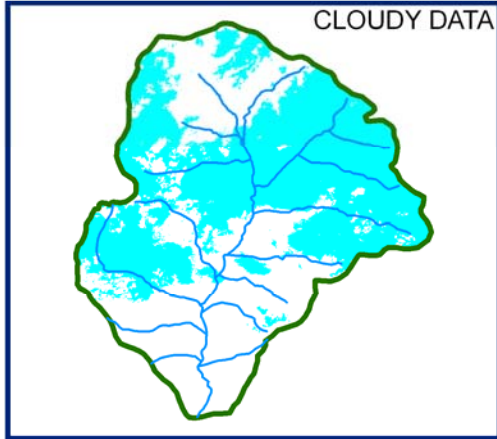
 SNOW



SNOW COVER MAP

:

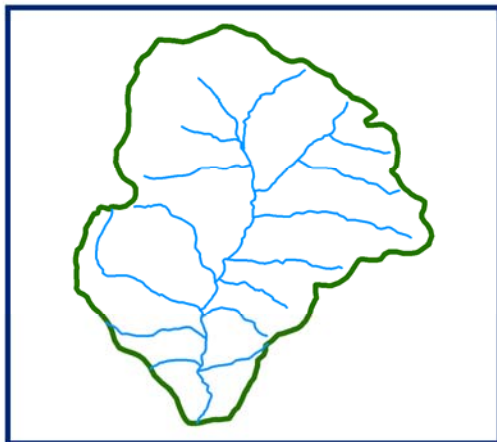
BEAS BASIN



04 APRIL 2010



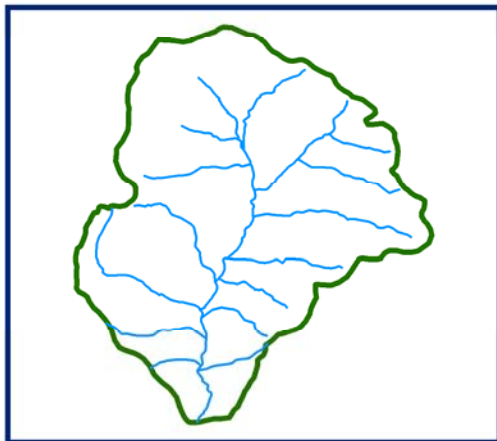
DATA NOT AVAILABLE



DATA NOT AVAILABLE



DATA NOT AVAILABLE

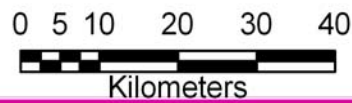


DATA NOT AVAILABLE

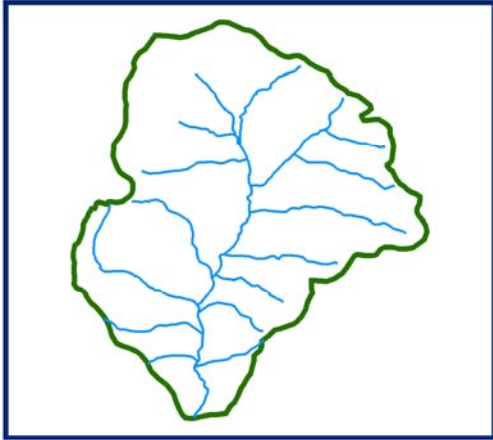


DATA NOT AVAILABLE

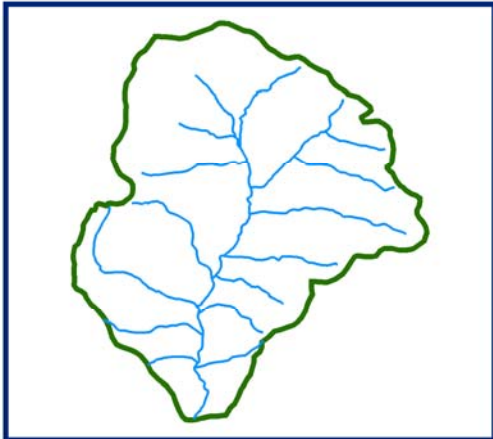
 SNOW



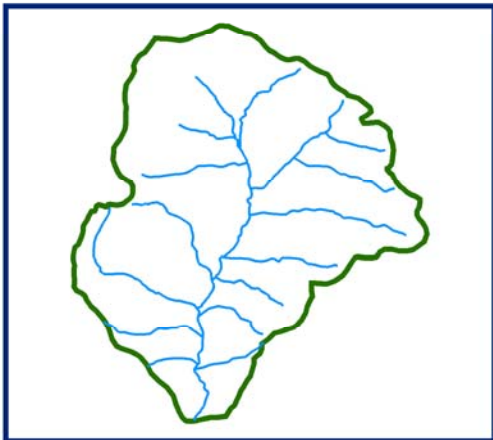
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
DATA NOT AVAILABLE

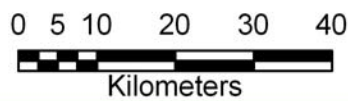


DATA USED
DATA NOT AVAILABLE



DATA USED
DATA NOT AVAILABLE

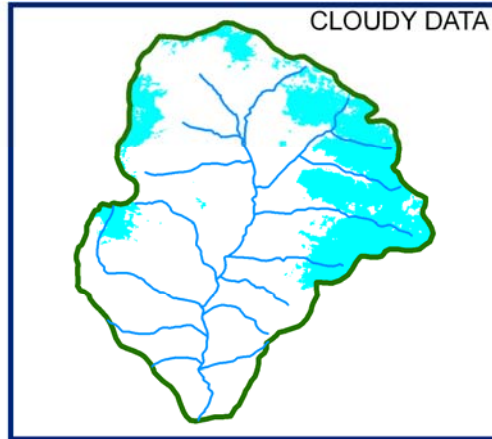
 SNOW



SNOW COVER MAP : BEAS BASIN



DATA NOT AVAILABLE



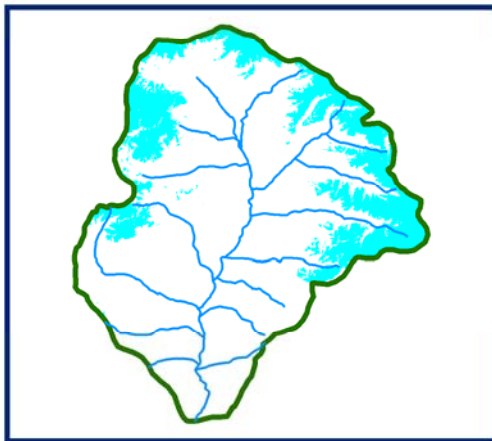
08 MAY 2010



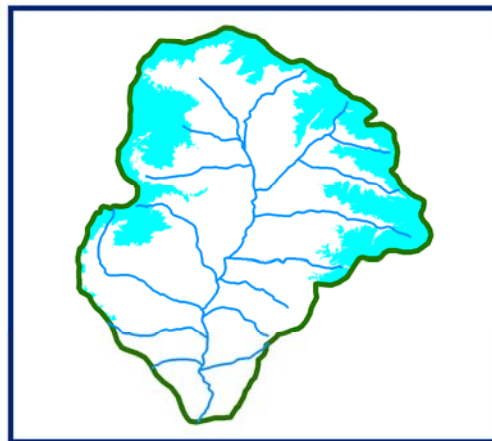
DATA NOT AVAILABLE




DATA NOT AVAILABLE



22 MAY 2010

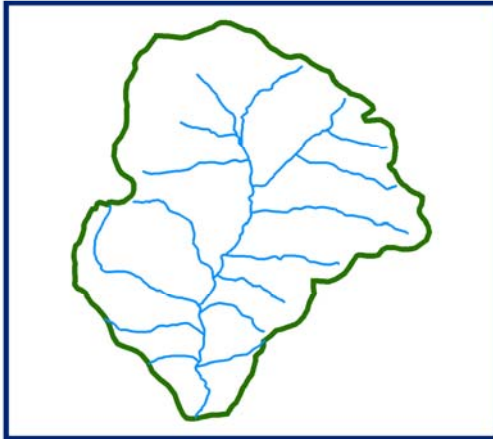


31 MAY 2010

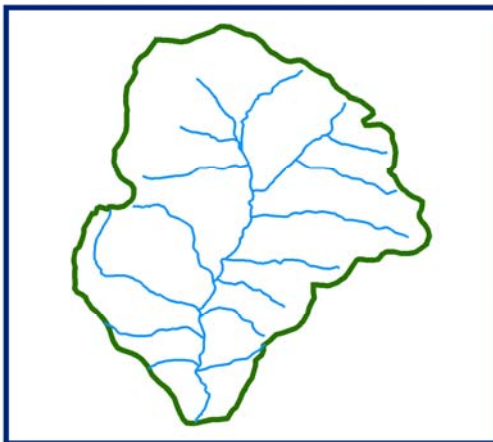
 SNOW



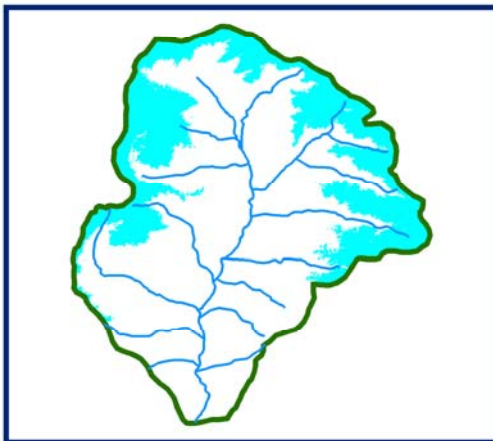
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
DATA NOT AVAILABLE

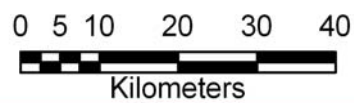


DATA USED
DATA NOT AVAILABLE

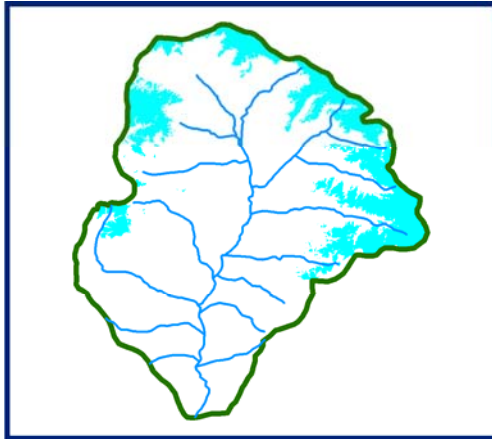


DATA USED
22 MAY 2010
26 MAY 2010
31 MAY 2010

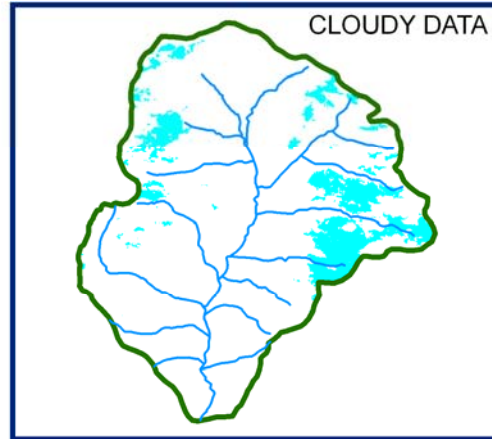
 SNOW



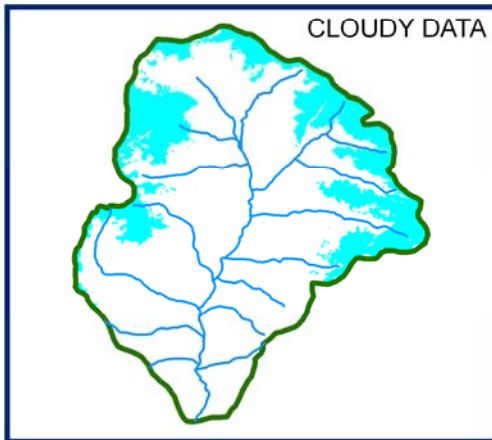
SNOW COVER MAP : BEAS BASIN



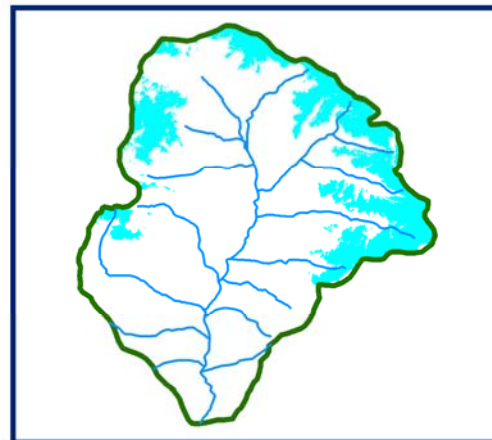
01 JUNE 2010



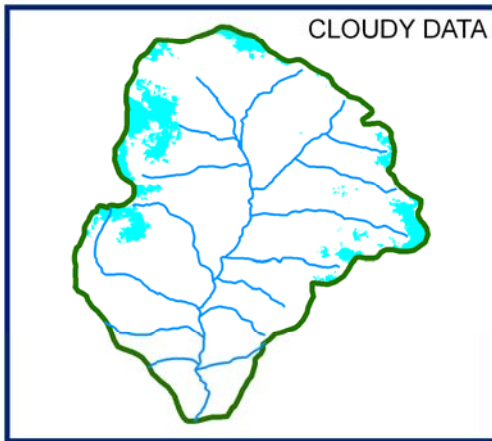
05 JUNE 2010



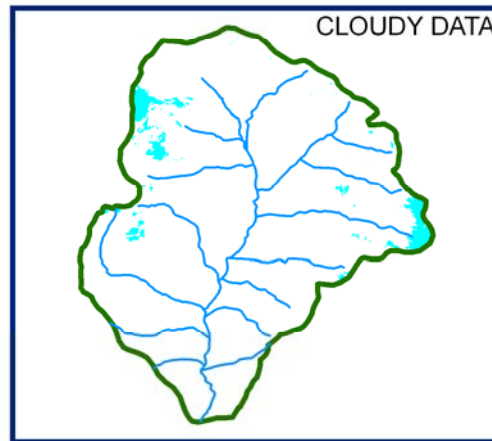
19 JUNE 2010




20 JUNE 2010



24 JUNE 2010

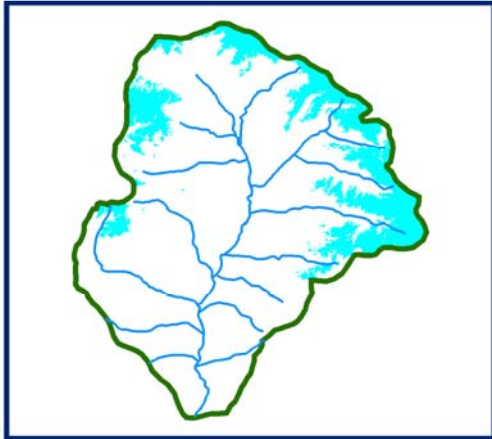


29 JUNE 2010

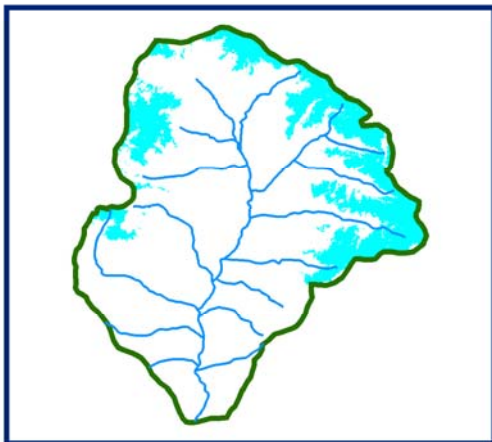
 SNOW



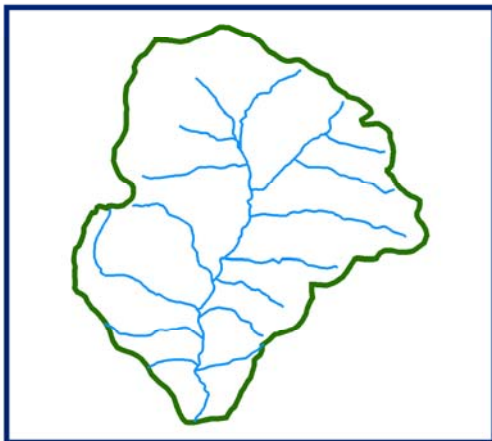
10 DAILY SNOW COVER MAP: BEAS BASIN



DATA USED
01 JUNE 2010



DATA USED
20 JUNE 2010



DATA USED
DATA NOT AVAILABLE

 SNOW

