

# The Afghanistan Agrometeorological Monthly Bulletin



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Page 2 ▶



Wheat Crop Condition

Page 4 ▶



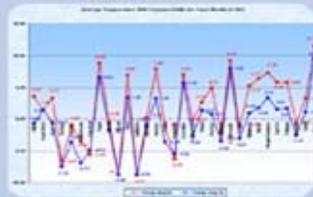
Synthesis Situation Map

Page 5 ▶



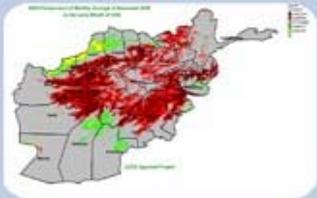
Rainfall Situation

Page 6 ▶



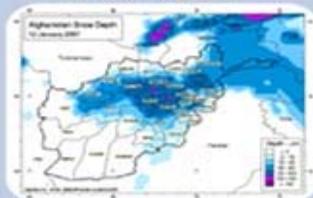
Rainfall Graphs

Page 10 ▶



Comparison of NDVI

Page 13 ▶



Afghanistan Snow Depth

The Agromet Project of USGS, supported by the US Agency for International Development (USAID), is working together with the Ministry of Agriculture and irrigation and the Afghan Meteorological Authority (AMA) of Ministry of Transport (MoT).

**Agromet Network**



# Table of Contents

<b>Crop Information.....</b>	<b>1</b>
• <b>Wheat Crop Phonological Stages.....</b>	<b>1</b>
• <b>Wheat Crop Conditions.....</b>	<b>2</b>
• <b>Adverse Factors.....</b>	<b>3</b>
• <b>Synthesis Situation Map.....</b>	<b>4</b>
<b>Rainfall Situation.....</b>	<b>5</b>
• <b>Rainfall Situation.....</b>	<b>5</b>
• <b>Rainfall Graphs .....</b>	<b>6</b>
• <b>Average Temperature.....</b>	<b>7</b>
• <b>Maximum and Minimum Temperature.....</b>	<b>8</b>
<b>Normalized Difference Vegetation Index (NDVI).....</b>	<b>9</b>
• <b>Normalized Difference Vegetation Index.....</b>	<b>9</b>
• <b>Comparison of (NDVI) .....</b>	<b>10</b>
<b>Snow Depth.....</b>	<b>11</b>
• <b>The Carbon Cycle.....</b>	<b>11</b>
• <b>Comparison of snow extent and depth.....</b>	<b>12-13</b>
• <b>Afghanistan Snow Depth.....</b>	<b>14</b>



## Summary

In Baghlan Province the flood has destroyed about 908 Jerib of agricultural land. While in Ashkashem District of Badakhshan Province and Khan Abad District of Kunduz Province flood has damaged about 3606 Jerib of agricultural land.

Comparison of monthly average of NDVI for the month of April 2007 with the same month in 2006 shows large increase in NDVI values occurred in the Northwestern region, Northern, some parts in Northeastern, some parts in eastern, most parts in the Southern and Western region during the month of April 2007 compared to the same month in 2006.

## Wheat Crop Phenological Stages

### Central Region:

In some parts of this Region the wheat is in vegetative stage as in Seya Gerd District and Chaharikar center of Parwan Province, Dashtak and Dara Districts of Panjshir Province, Mahmood Raqee center of Kapisa Province, Chak and Jaghtoo Districts of Wardak Province, Kariz Mir and Paghman Districts of Kabul Province. In Sarobi District of Kabul Province the wheat is in maturity stage.

### Southern Region:

From Nad Ali, Nawa and Greshk Districts of Helmand Province and Urozgan Province wheat is in the flowering stage. It is reported from center of Zabul Province and Sardy and Maqur District of Ghazni Province that wheat crop is in vegetative stage. And indicated from Nemroz Province and Kandahar Province that wheat is in maturity stage.

### East Central Region:

In central Bamyan Province reports are indicating that wheat is in emergence and vegetative stages. In Panjob District of Bamyan Province seedling of wheat crop has taken place. In Yakawlang District of Bamyan Province the winter wheat is in vegetative stage and the spring crops are in planting stage.

### Western Region:

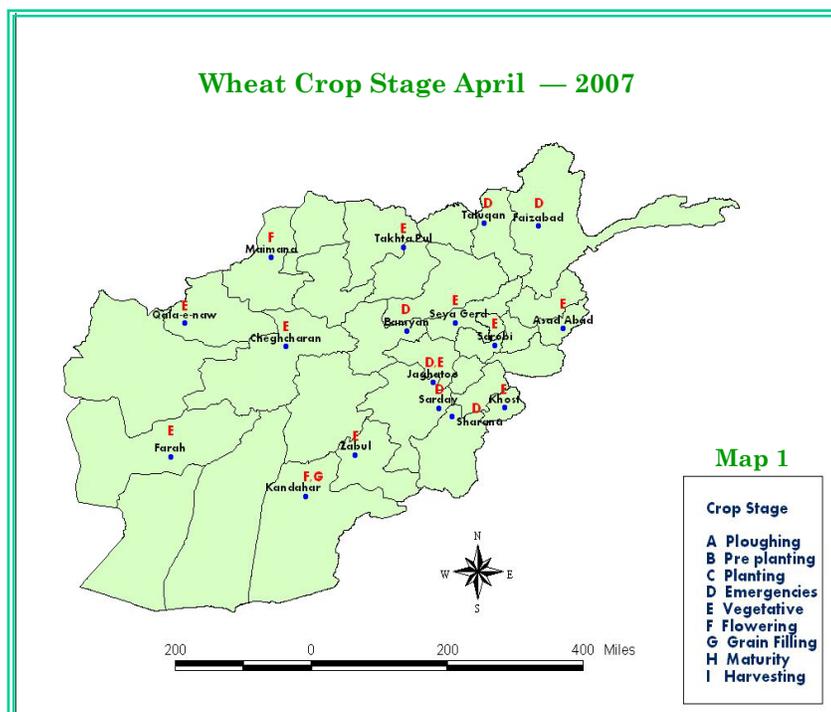
In Ghor Province, and Maqor District and Qala-e-Naw central Badghis Province that wheat is in vegetative stage (plant height is more than 10 cm). In Farah Province reports are indicating that wheat is in emergence stage.

### North East Region:

In most parts of this Region the wheat is in vegetative stage as in Imam Sahib, Chahardara and Aqtipa Districts and center of Kunduz Province, Bangi District and center of Takhar Province. Reports are indicating from Baghlan Province that wheat crops are in flowering and vegetative stage. In Ashkashem District of Badakhshan Province reports showed that wheat crop seeding has taken place.

### North Region:

Reports from this Region are indicating that wheat is in flowering stage as in Maimana center of Faryab Province, Saripul province and central Shebrghan and of Jawzjan Province.



## Crop Phenological Stages

### Eastern Region:

In some parts of this Region as Mehterlam central Laghman Province, Asmar and Asad Abad center of Kunar Province and Agam District and central Nangarhar Province reports are saying that wheat is in flowering stage.

### South Eastern Region:

In Khairkot District and central Paktika Province wheat crop is ranging from flowering to grain filling stage. Reports from Rohani Baba Zurmat District and central Gardiz Province and khost Province are showing that wheat is in vegetative stage (plant height is more than 10 cm).

## Crop Condition

### Central Region:

In most parts of this Region wheat is in normal condition as in Chak, and Jaghatoo Districts of Wardak Province, Seya Gard District of Perwan Province, Kohestan District and Mahmood Raqee central Kapisa Province, Dara and Dashtak Districts of Panjshir Province, Sarobi and Paghman District of Kabul Province.

### Western Region:

Reported from Maqur District and Qala-e-Naw central Badghis Province, Farah Province, Ghor and Hirat Provinces are indicating normal crop condition.

### Eastern Region:

In most parts of Eastern Region wheat is in normal condition as in Asmar District and central Kunar Province, Agam District of Nangarhar Province and Mehterlam central Laghman Province.

### East Central Region:

From this Region reports are indicating normal wheat crop condition as in Yakawlang and Shiber Districts and central Bamyan Province.

### South Eastern Region

Reports from Rohani Baba and Zurmat Districts of Gardiz Province, Urgon and Khairkot Districts and central sharana Paktika Province are indicating that wheat is in normal condition. But central Khost and central Gardiz Provinces are showing better crop condition.

### North Eastern Region:

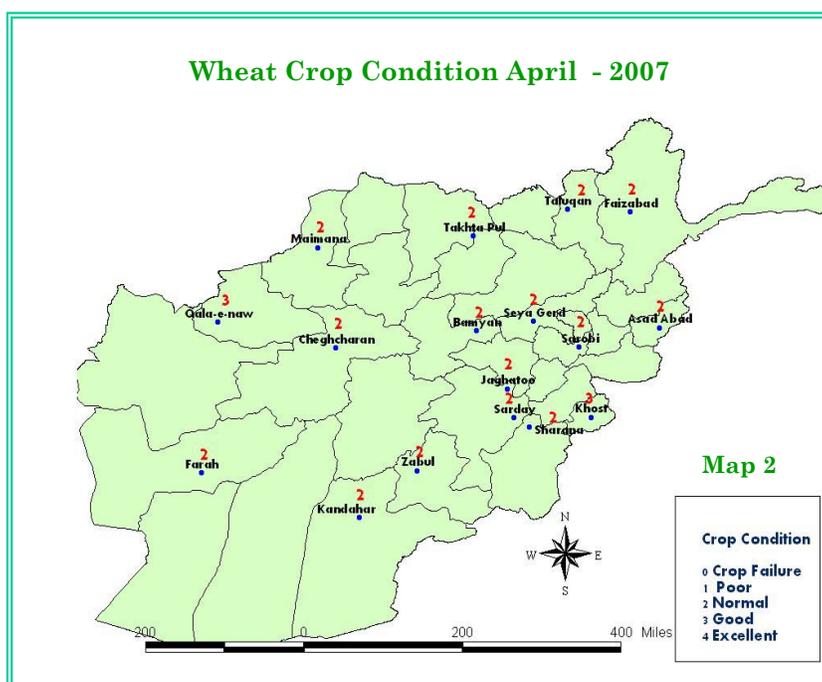
In some parts of this Region as Bangi District and center Takhar Province, Ashkashem District of Badakhshan Province, Baghlan Province, Aqtipa and imam sahib Districts and center Kunduz Province reports are indicating normal wheat crop condition.

### Northern Region:

In most parts of this Region wheat is showing normal condition as in Nehershahi and Dehdadi Districts of Balkh Province and Central Jawzjan Province. Reports are indicating in Saripul Province that wheat is in good condition.

### Southern Region:

In this Region wheat is in normal condition as in Nad Ali, Nawa and Greshk Districts and central Helmand Province, Maqur and Sardy Districts of Ghazni Province, Kandahar province, Nimroz Province and Zabul Province



# Adverse Factors

## Central Region

During the month of April 2007 reports are indicating from Siya Gerd District of Parwan Province, Sarobi District of Kabul Province, Dashtak central Panjshir Province and Kohistan District and central Kapisa Province that main adverse factors are shortage of inputs, shark frost, heavy storm, too much weeds, late planting and severe attack of insect pest diseases.

## East Central Region:

In this Region reports showed that main adverse factors were shortage of agricultural inputs, diseases and pests attack, heavy snow and too much weeds as in Panjab District and Central Bamyán Province.

## North Eastern Region:

Reports are indicating adverse factors from Bangi District and central Takhar Province are heavy snow, shortage of inputs, too much weeds and attack of Beetles on agricultural fields. In Baghlan Province the flood has destroyed about 908 Jerib of agricultural land. While in Ashkashem District of Badakhshan Province and Khan Abad District of Kunduz Province flood has damaged about 3606 Jerib of agricultural land.

## Northern Region:

The main adverse factors noted in this region were shortage of agricultural inputs, pest diseases and late planting. As reports indicated from central Sari-pul Province, Dehdady and Marmal Districts of Balk Province main adverse factors were attack of locust which has damaged agricultural lands.

## Southern Region:

During the month of April 2007 the main adverse factors in Zabul and Kandahar Provinces were too much weeds, shortage of agricultural inputs. Reports showed from Nimroz Province main adverse factors were pest and diseases and heavy storm which destroyed agricultural fields. But from Greshk District of Helmand Province reported severe attack of locust on green orchards and agricultural cultivation.

## Western Region:

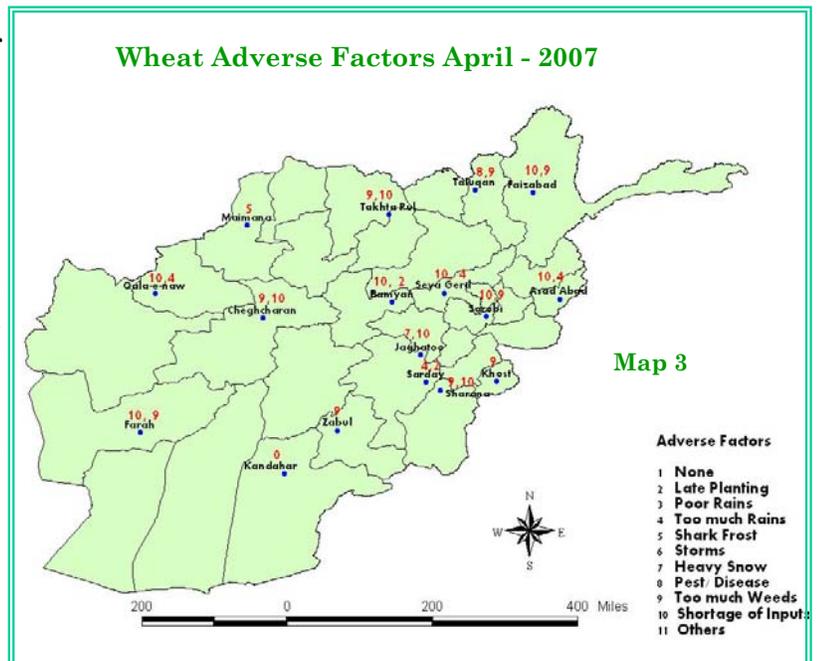
In some parts of this Region as Magur District and central Badghis Province and Farah Province main adverse factors were lack of agricultural inputs and late planting. Reports showed from Hirat Province that flood has destroyed about 120 Jerib agricultural lands.

## Eastern Region:

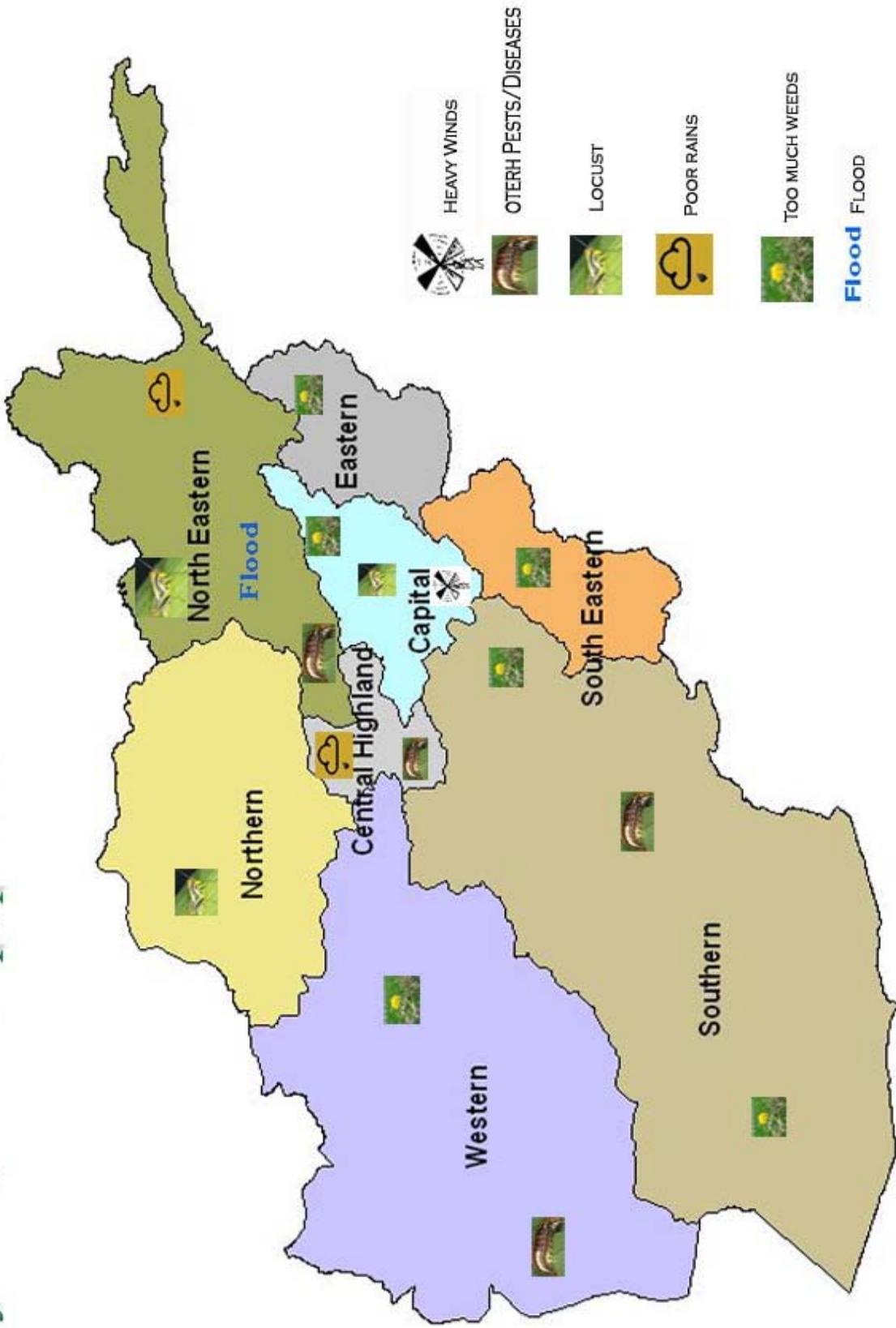
Reports are indicating from Mehterlam central Laghman Province shortage of agricultural inputs and too much weeds. In Asad Abad central Kunar Province and Agam central Nangarhar Province had heavy rain and wheat rust which damaged most fields of wheat crop.

## South Eastern Region:

In most parts of this region the adverse factors were shortage of agricultural inputs, late planting and too much weeds as in Khost Province and Khaikot and sharana Districts of Paktika Province.



*Synthesis Situation Map April 2007*



Map 4

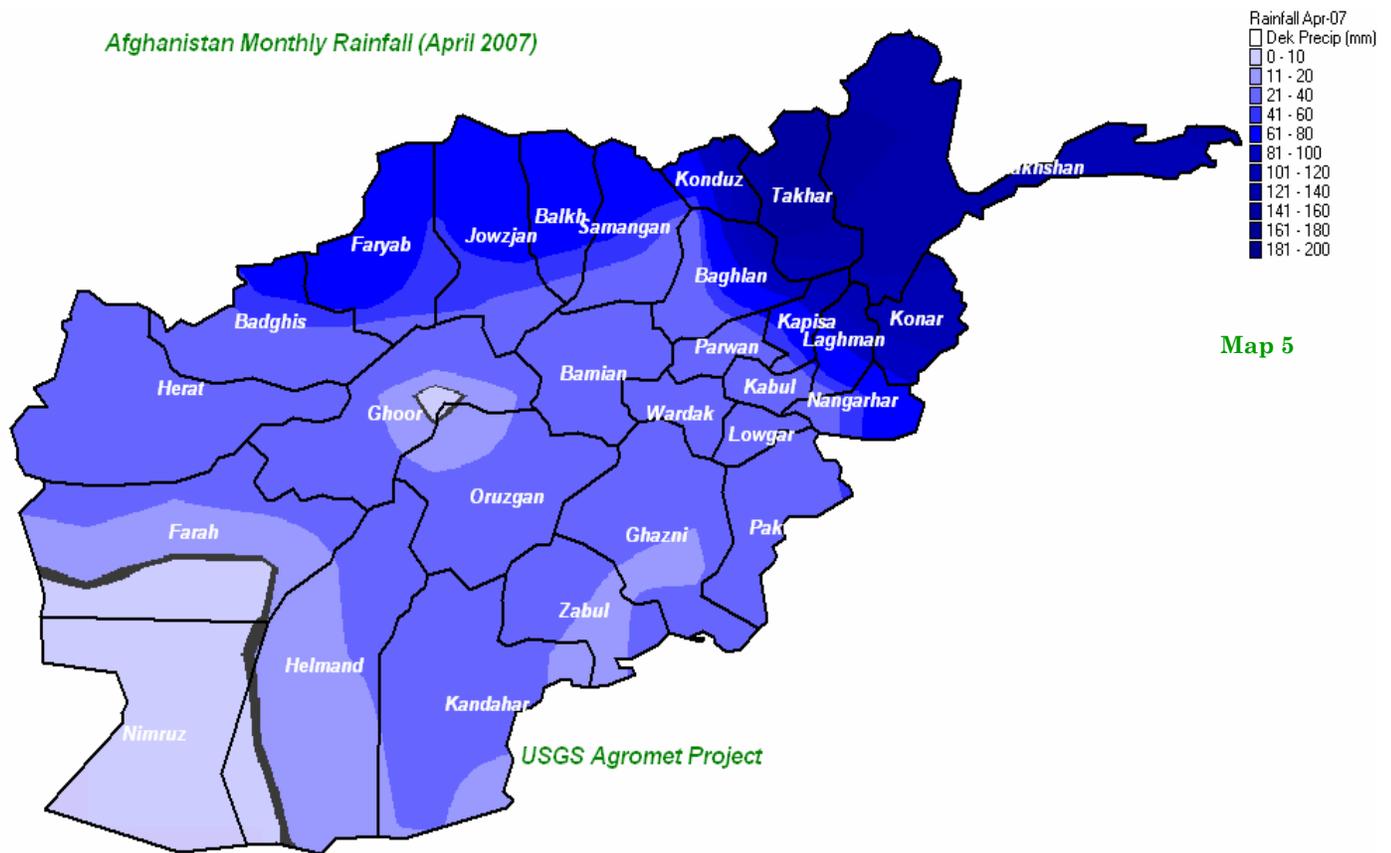
## Rainfall Satiation

Rainfall for the month of April 2007 is significantly lower compared to the same month in 2006 in most parts of the country, except Faizabad, Ghaziabad and Taluqan, where the cumulative observed rainfall was more than that over the same month in 2006 (chart 1). The percentage +/- of rainfall throughout the country is as follows:

Baghlan -16 %, Darul Aman -77 %, Faiz Abad 149 %, Farah %, Gardiz -74 %, Ghazni -100 %, Ghaziabad 33 %, Jabul Seraj -73 %, Jalalabad -100 %, Kabul -68 %, Kandahar -100%, Kariz Mir -100 %, Kunduz -30 %, Logar %, Maimana -24 %, Mazar --68 %, Paghman -100 %, Sheberghan -84 %, Sarobi -100 %,Sari Pul, -68 % and Taluqn 140 %.

For the month of April 2007 the over all amount of precipitation is lower than that compared to the same month of long term average except in Kunduz and Sari Pul where the rainfall had an increased during the month of April 2007 compared to the same month of long term average. Chart ( 2 ) shows comparison between cumulative rainfall for the month of April 2007 and the same month of long term average across the country. The percentage +/- of rainfall is as follows:

Baghlan -74 %, Darul Aman -93 %, Faiz Abad -9 %, Farah -100 %, Gardiz -47 %, Ghazni -100 %, Ghaziabad -64 %, Jabul Seraj -94 %, Jalalabad -100 %, Kabul -88 %, Kandahar -100 %, Kariz Mir -100 %, Kunduz 70 %, Logar -78 %, Maimana -46 %, Mazar -81 %, Paghman -100 %, Sheberghan -91 %, Sarobi -100 %, Sari Pul 226 % and Taluqan -20 %.

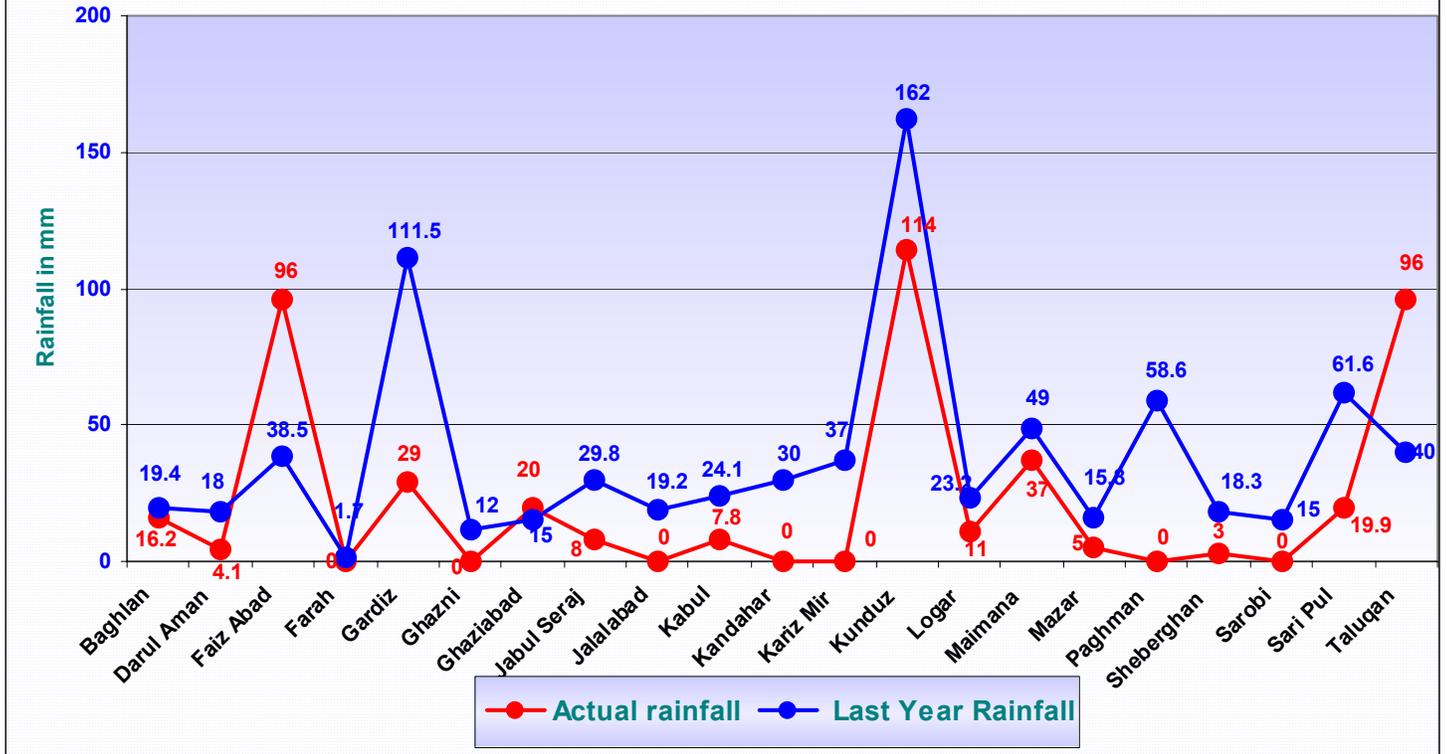


Distribution of rainfall varies in different regions of the country as Map ( 5 ) shows more rainfall occurred in various parts of the Northeastern region particularly in Takhar province, Some parts of Southern and Southwestern regions ( Zabol, Kandahar, Helmand Nimroz and farah in particular) experienced less amount of rainfall than other regions during the month of April 2007

# Rainfall Graphs for the Month of April 2007

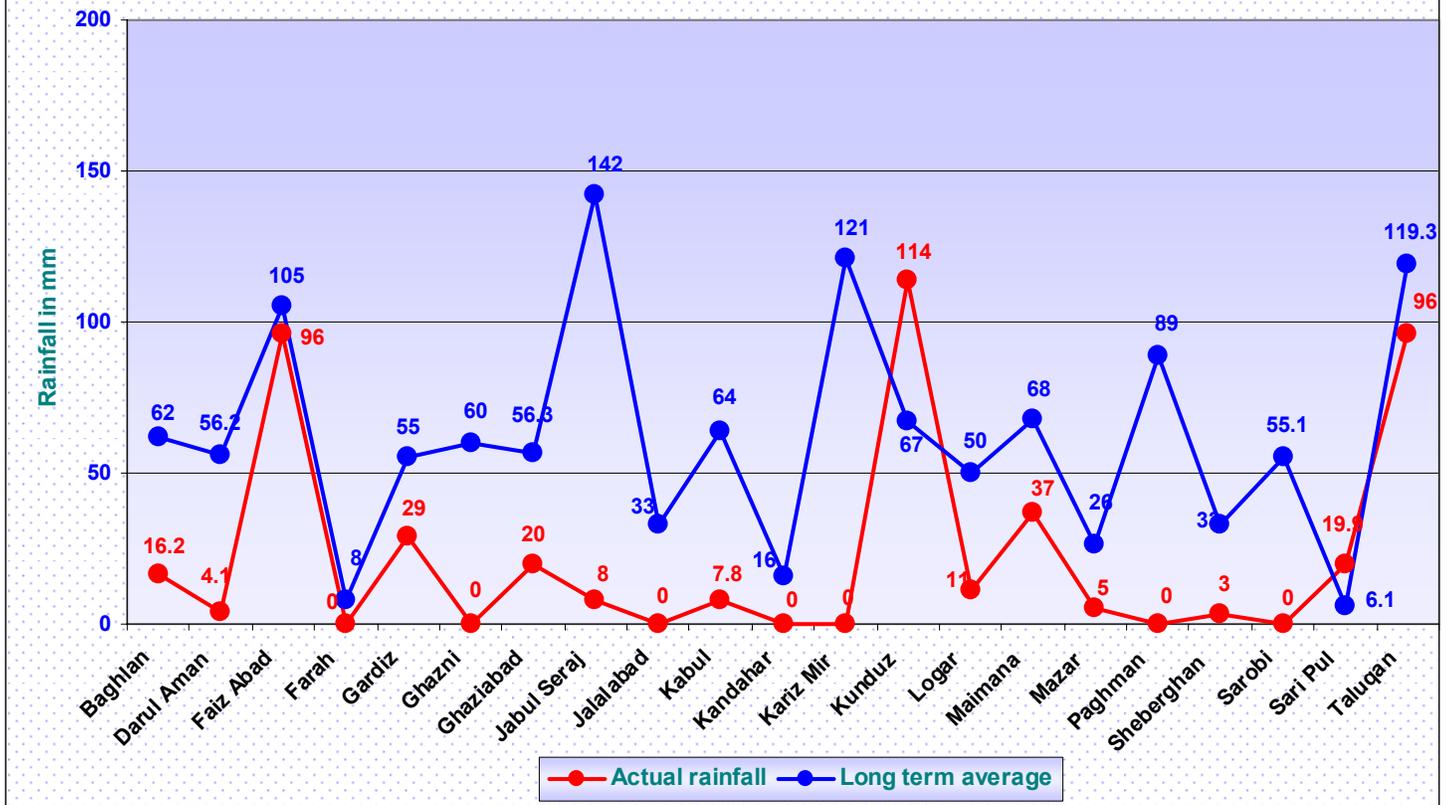
## Comparison of Actual and Last year Monthly Rainfall (April 2007)

Chart 1



## Comparison of Actual and Long Term Average Accumulated Rainfall (April 2007)

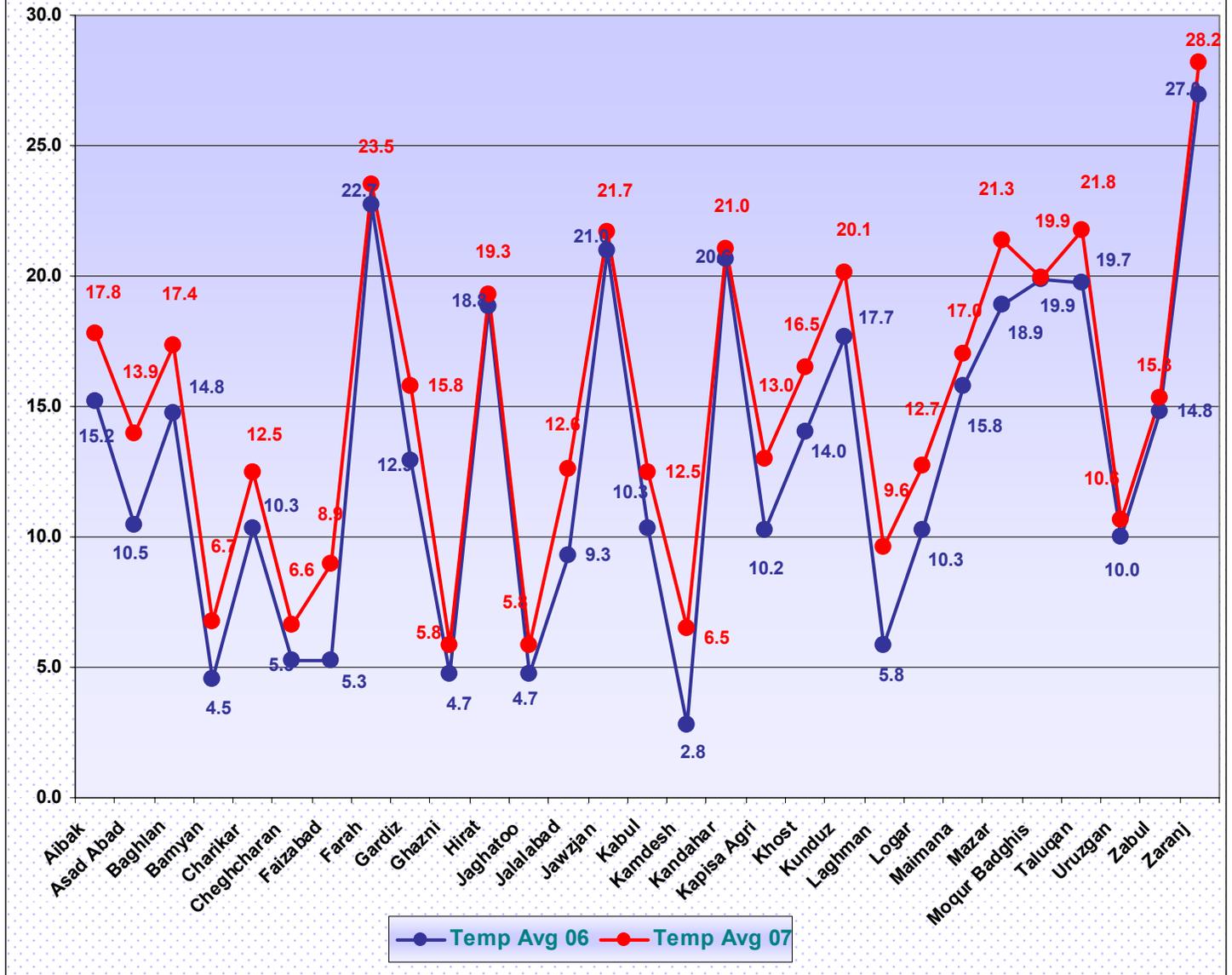
Chart 2



## Average Temperature for the Month of April 2007

Average Temperature 2007 Compared with the Same Month of 2006

Chart 3



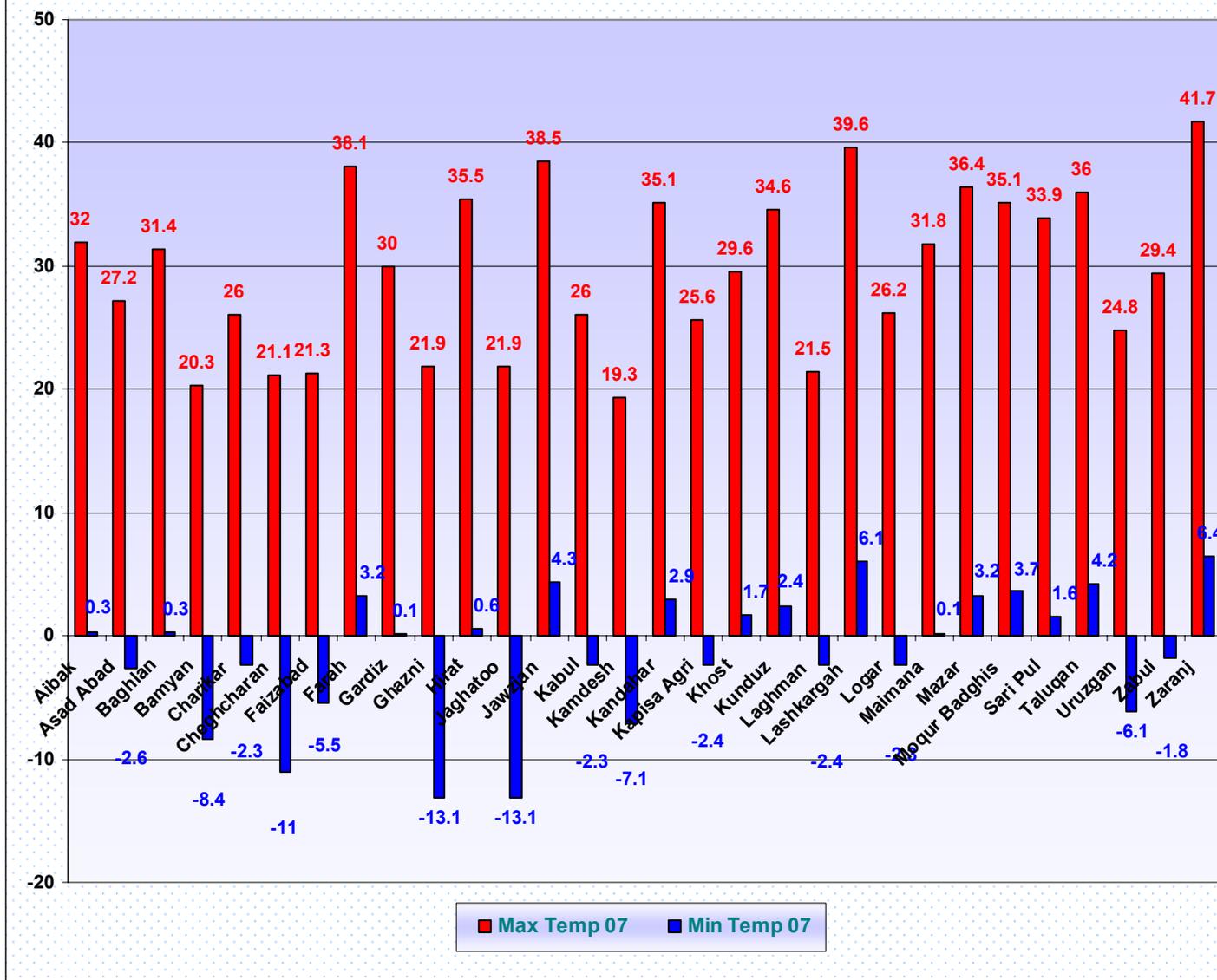
Temperature for the month of April 2007 had increased as compared to the same month in 2006 across the country.

In general higher temperatures were recorded for the month of April 2007 compared to the same month in 2006 across the country. Comparison of temperature values (Chart 3) shows higher temperature were observed during the month of April 2007 over the same month in 2006 throughout the country.

Temperature differences for the month of April 2007 compared to the same month in 2006 is 1 – 3 ° C likely higher temperature during April 2007 compared to the same month in 2006. The temperature raised gradually and resulted lower rate of snow depth.

Minimum and Maximum Temperature April 2007

Chart 4

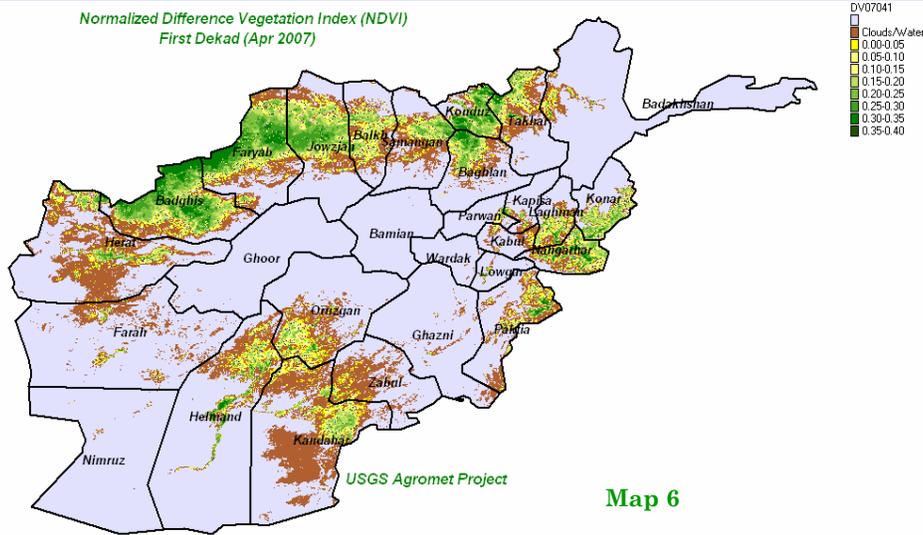


Zaranj center of Nimroz Province with 41.7 ° C was the warmest spot in the country

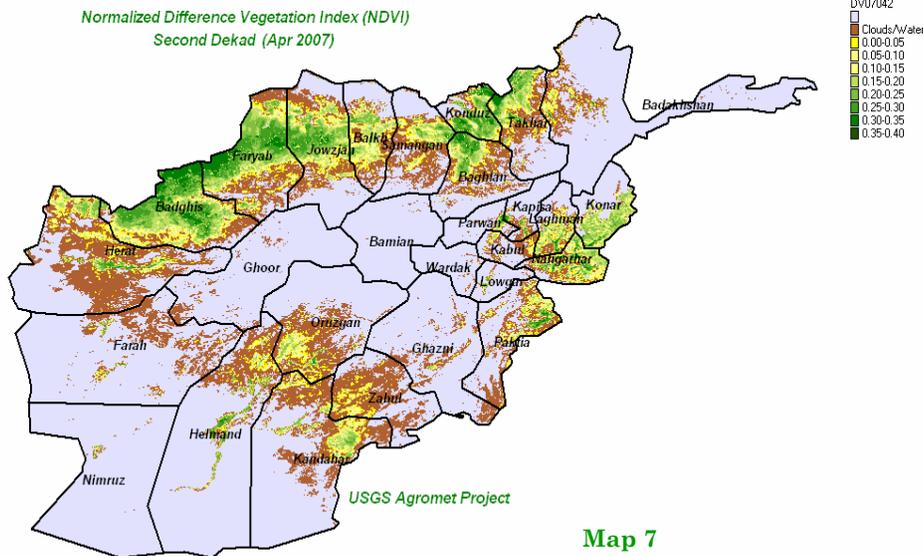
Chart 4 shows maximum and minimum temperature for the month of March 2007 where the maximum temperature was above freezing point across the country and the minimum temperature remained at freezing point for 50 % of the station, while remaining stations recorded the minimum temperature above freezing point during the month of April 2007.

Zaranj central Nimroze Province with 41.7 ° C was the warmest spot in the country, Ghazni and Jaghatoo with -13.1° C experienced extreme cold compared to other regions of the country.

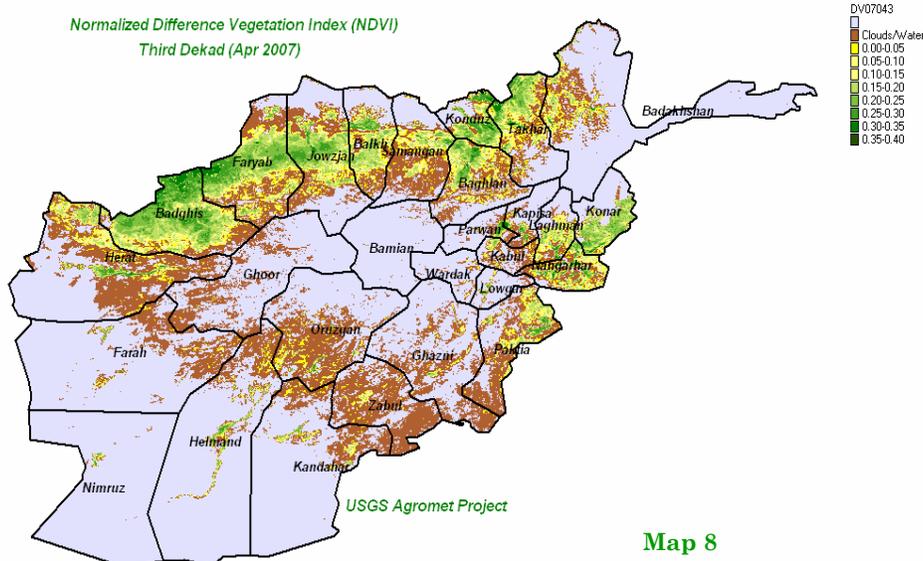
# Normalized Difference Vegetation Index (NDVI) (April 2007)



Vegetation Index (NDVI) 1st Dekad of April 2007—Afghanistan



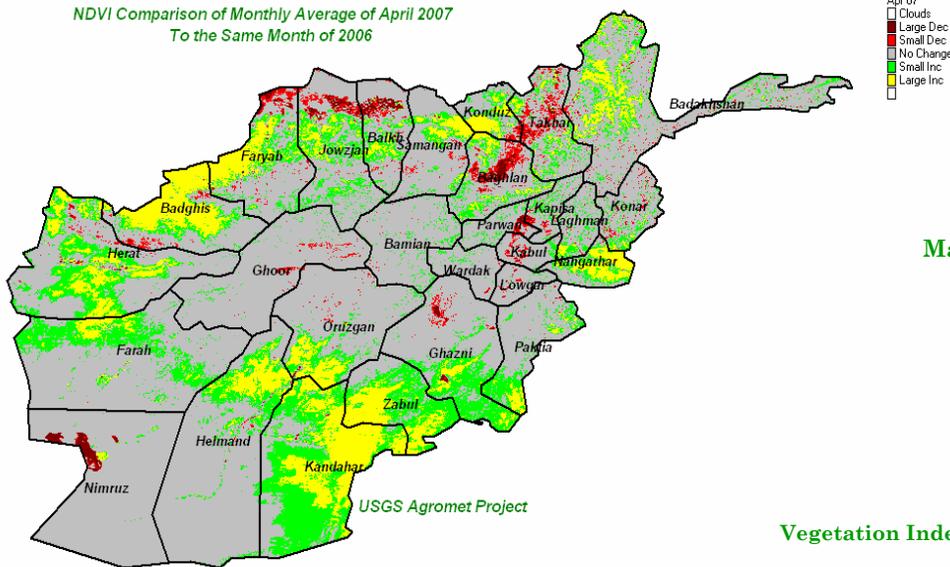
Vegetation Index (NDVI) 2nd Dekad of April 2007—Afghanistan



Vegetation Index (NDVI) 3rd Dekad of April 2007—Afghanistan

# Comparison of NDVI April 2007

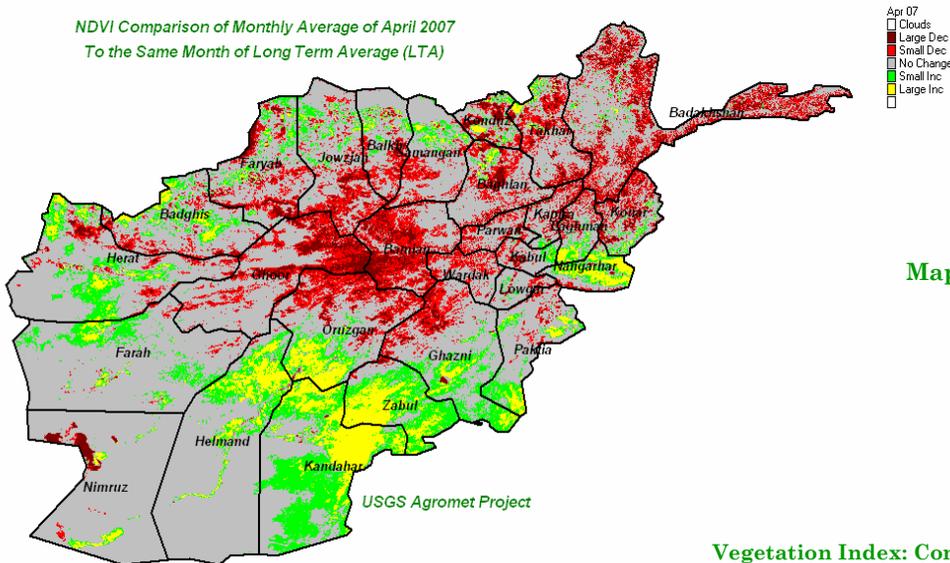
NDVI Comparison of Monthly Average of April 2007  
To the Same Month of 2006



Map 9

Vegetation Index: Comparison to Last Year

NDVI Comparison of Monthly Average of April 2007  
To the Same Month of Long Term Average (LTA)



Map 10

Vegetation Index: Comparison to Long Term Average

## NDVI: March 2007

Comparison of monthly average of NDVI for the month of April 2007 with the same month in 2006 (map 9) shows large increase in NDVI values occurred in the Northwestern region, Northern, some parts in Northeastern, some parts in eastern, most parts in the Southern and Western region during the month of April 2007 compared to the same month in 2006 and small decrease in NDVI values occurred and limited areas in the Northern flat area, some parts in the Northeastern and capital.

There is no change in NDVI values in the remaining regions in the country. Comparison of NDVI monthly average for the month of April 2007 with the same month of long term average (map 10) shows large increase in NDVI values in some parts of the Southern region, some parts in eastern and limited areas in the Western regions. Large decrease in NDVI values occurred in the Central Highlands and neighboring areas, small decrease in NDVI values were noticed in the country.

# The Carbon Cycle

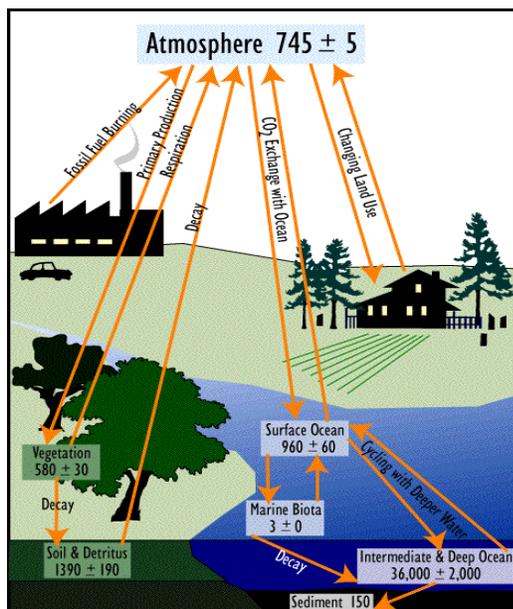
The Carbon Cycle is a complex series of processes through which all of the carbon atoms in its existence rotate. The same carbon atoms in your body today are used countlessly for multi purposes. The wood burned few decades ago produced carbon dioxide which through photosynthesis became part of the plant. When you consume that plant, the same carbon from the wood which was burnt can become part of your body.

The carbon cycle is the great natural recycler of carbon atoms. Unfortunately, the extent of its importance is rarely stressed enough. Without the proper functioning of the carbon cycle, every aspect of life could be changed dramatically.

The carbon element is continually moving among the earth's lithosphere, hydrosphere, biosphere, and atmosphere in various forms--as carbon dioxide (CO<sub>2</sub>), sugars or carbohydrates (C<sub>n</sub>H<sub>2n</sub>O<sub>n</sub>), and calcium carbonate (CaCO<sub>3</sub>). The movement of carbon among the earth's spheres is diagrammed below:

The boxes in the diagram indicate carbon sources (places of origin) and carbon sinks (places of storage). The arrows indicate the movement of the element among the earth's spheres.

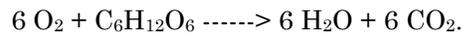
Green plants play vital role in the carbon cycle. They absorb carbon dioxide (CO<sub>2</sub>) from the atmosphere and produce carbon-containing sugars. This process is called Photosynthesis.



There are two main steps in photosynthesis. 1-Plants trap the sun's light energy in a compound called chlorophyll. This energy is converted to a chemical form called adenosine triphosphate (ATP). 2- Plants use the energy from ATP to produce sugar (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>). The process of photosynthesis requires water (H<sub>2</sub>O). It also produces water as well as oxygen (O<sub>2</sub>). The net chemical reaction for the process of photosynthesis is:



Animals eat plants to obtain the energy trapped during photosynthesis. As the animals bodies break down the carbohydrates in the plant tissue, CO<sub>2</sub> is released to the atmosphere. This process is called Respiration. The net chemical reaction for the process of respiration is the exact opposite of photosynthesis:

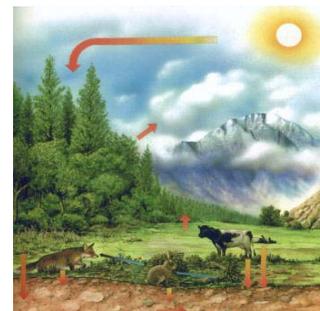


Plants respire as they break down the organic molecules in themselves in order to release the stored energy. Plants and animals also release CO<sub>2</sub> to the atmosphere when they decompose plant materials. The chemical reaction for this process is the same as that for respiration.

When dead plants and animals are decayed slowly under high pressure and high temperatures, they may form pools of energy known as fossil fuels. Fossil fuels include coal, oil, and natural gas. People burn fossil fuels for energy purposes. The energy is used for heating, operating systems, automobiles etc. The chemical process of burning fuel--known as combustion--is the same as respiration and decomposition:

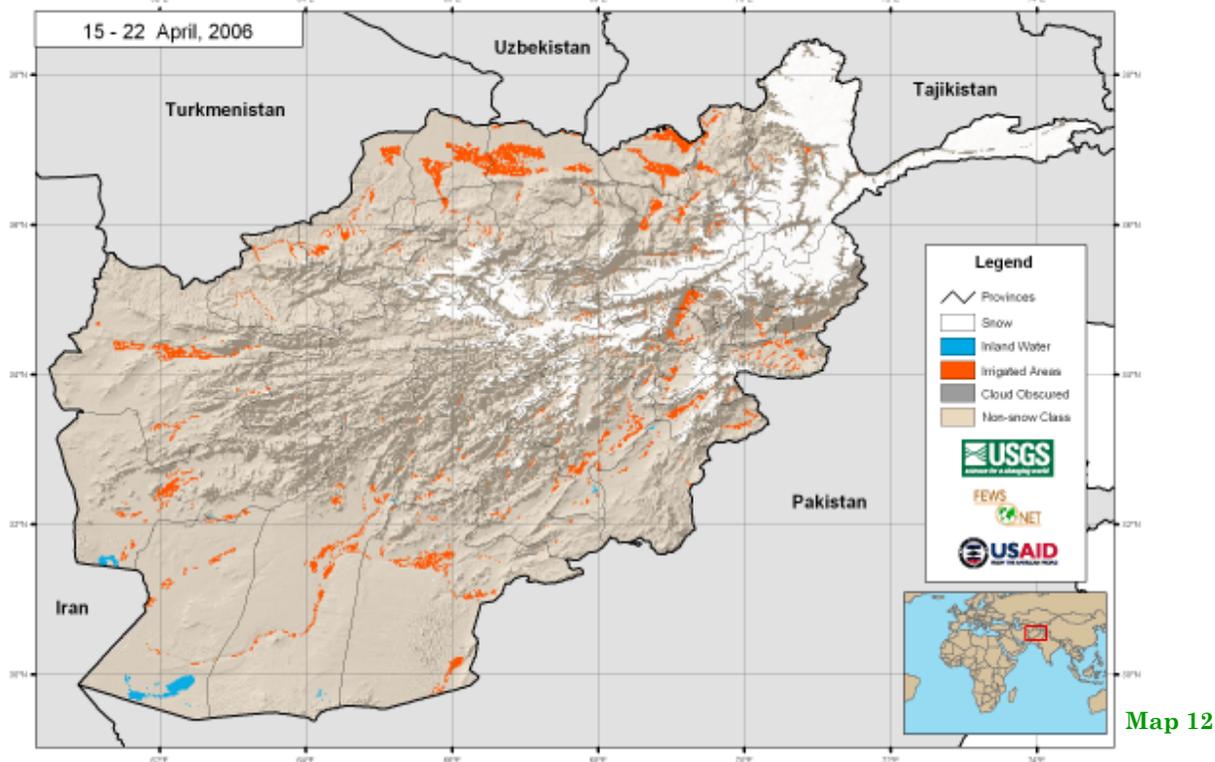
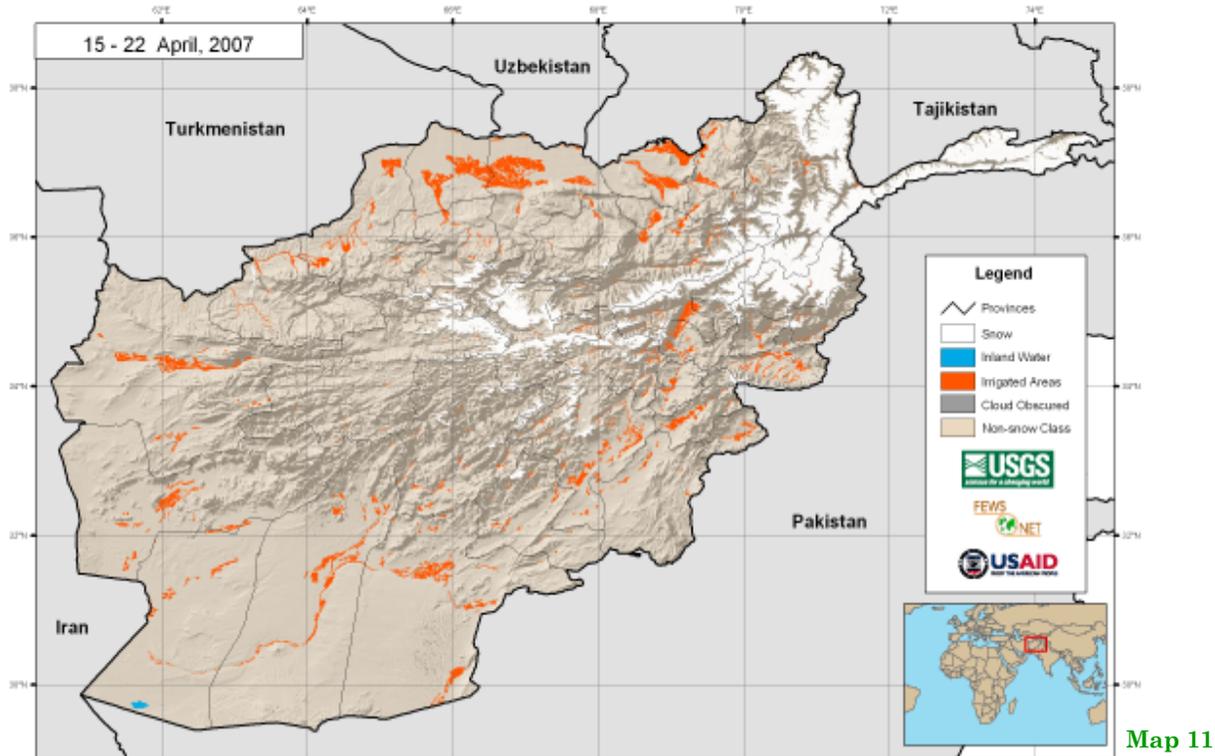


Since the Industrial Revolution, humans have burned increasingly greater amounts of fossil fuels in order to produce more energy. The amount of carbon dioxide produced from burning of fossil fuels are emitted in to the atmosphere and resulted in greater pollution which is harmful for human life



# Comparison of Snow Extent

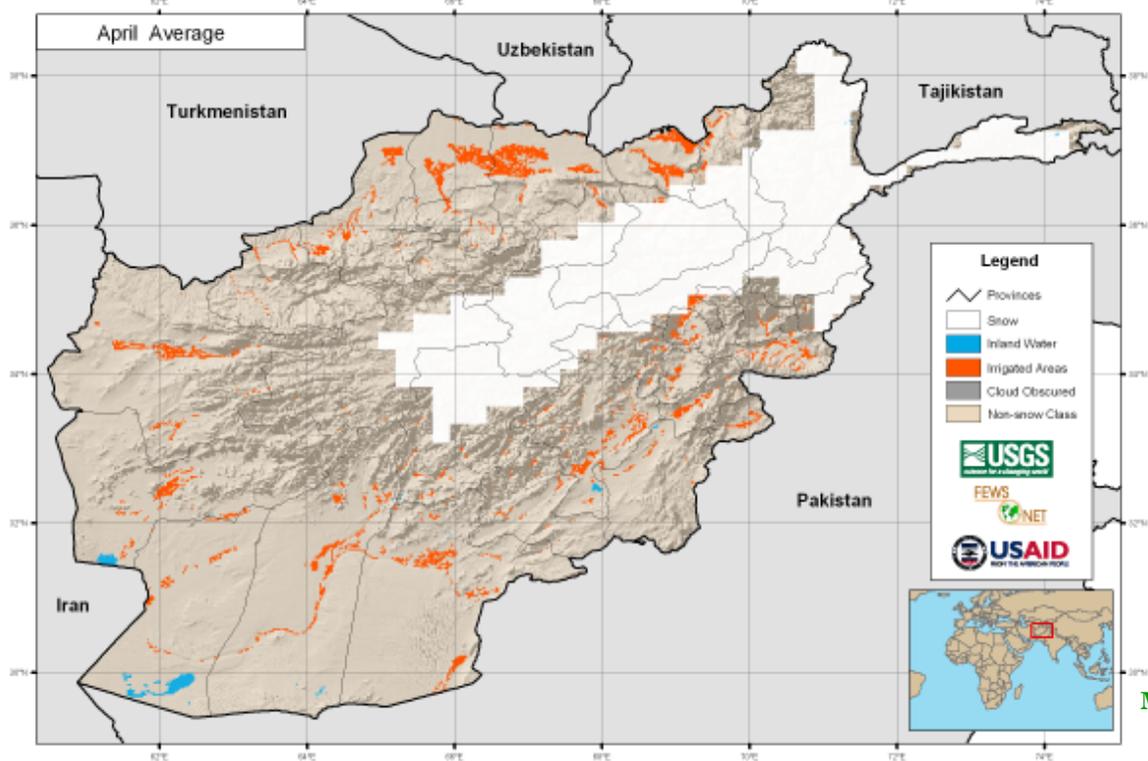
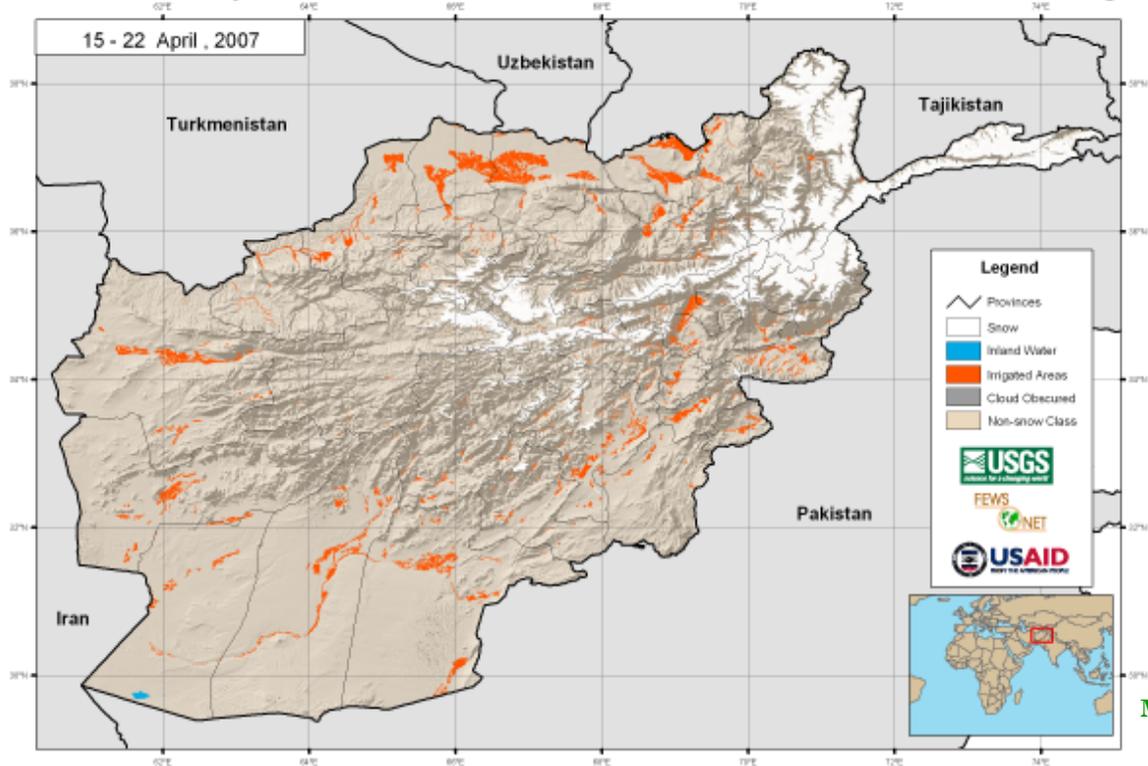
## MODIS 8-day Snow Cover Extent - Current Period 2007 vs 2006



Comparison of snow extent for the period (15 – 22) April 2007 with the same period in 2006 (maps 11 and 12) show no significant change occurred in snow extent during the month of April 2007 over the same month in 2006 in the snow coverage areas, however small decrease of snow extent occurred in limited part of the Northeastern which is not considerable.

## Comparison of Snow Extent

### MODIS 8-day Snow Cover Extent - Current vs. Historical Average



Comparison of snow extent for the month of April 2007 with the same month of long term average (maps 13 and 14 ) shows significant decrease of snow extent during the month of April 2007 over the same month of long term average in the snow coverage area.

## Flood

In the month of April 2007 due to snow melt several provinces experienced flood. The people and agricultural land has damaged severely, where the casualties are as follows:

No	Province	Type of Disaster	Casualties			Affected Families	Affected Houses		Fruit Trees	livestock	Affected Areas	
			kill ed	Inju red	miss ed		Dest royed	Dama ged			Agr.Lands in Jirebs	Other
1	Badakhshan	Flood					50	110	1000	360	725	40 Garden,3 Hydropowe,66 Shops, 6 Km road
2	Takhar	Flood	3							204	1110	
3	Kunduz	Flood		1			153				1536	
4	Smangan	Flood	4	4		1527	364	26	440	1167	7286	62 km Water canal 1 Mosque
5	Baghlan	Flood	1	6		79	41	43		241	1658	
<b>Total</b>			<b>8</b>	<b>11</b>		<b>1606</b>	<b>608</b>	<b>179</b>	<b>1440</b>	<b>1972</b>	<b>12315</b>	

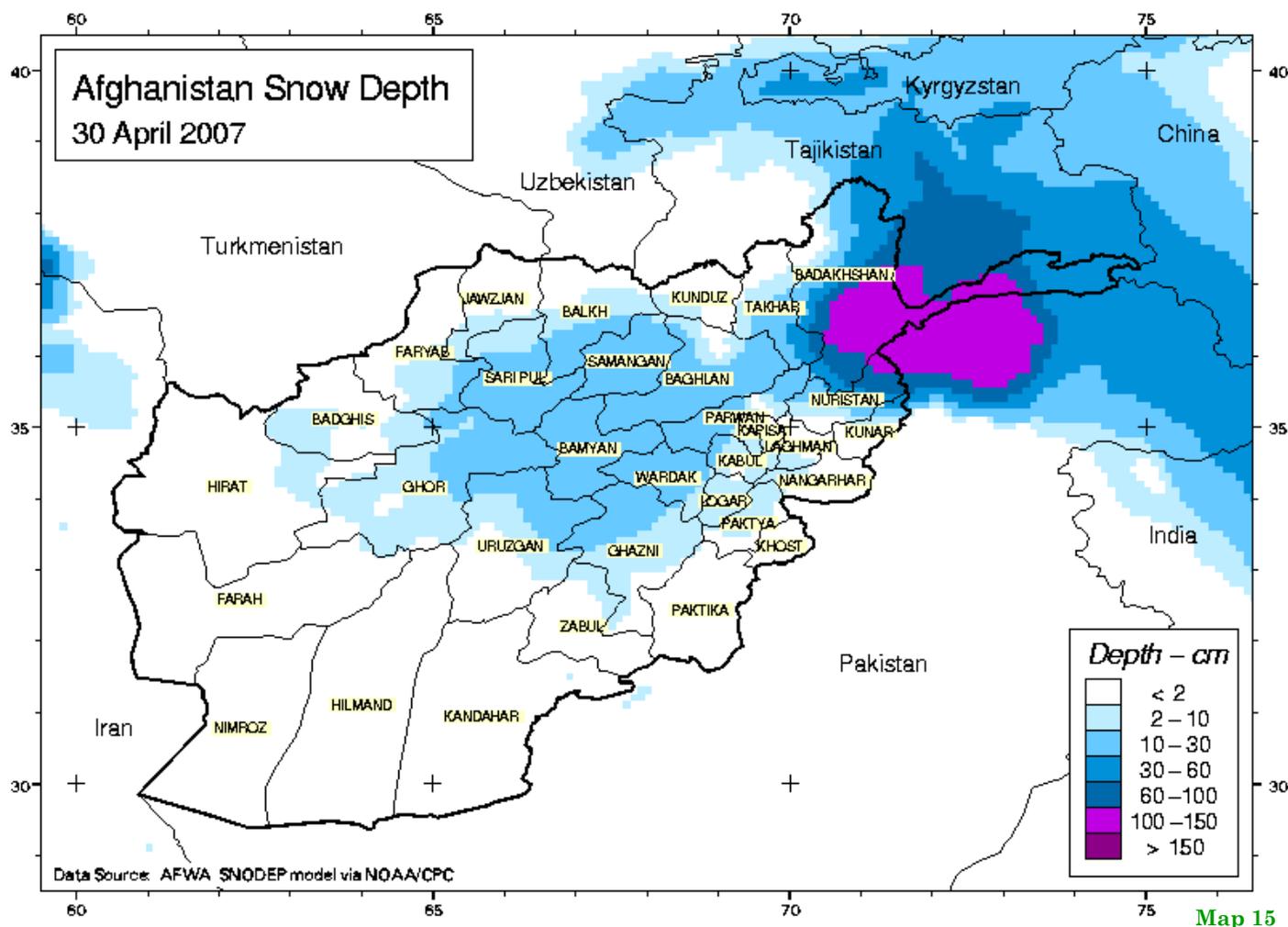


March 22, 2007



March 14, 2007

## Afghanistan Snow Depth April 2007



Map ( 15 ) shows snow depth in the country where the snow depth has been recorded from 100 cm up to 150 cm in the Northeastern region and 10 to 30 cm from Central Highlands and neighboring areas.

**For more information please contact:**

**Mohammad Fahim Zaheer**

[fahim.zaheer@agriculture.gov.af](mailto:fahim.zaheer@agriculture.gov.af)  
[fahimzaheer@gmail.com](mailto:fahimzaheer@gmail.com)

Cell: 0772214307, 0799793334

Or

**Abdussalam Shinwary**

[asalam.shinwary@agriculture.gov.af](mailto:asalam.shinwary@agriculture.gov.af)  
[salam.shinwary@gmail.com](mailto:salam.shinwary@gmail.com)

Cell: 070156738

You can download the Afghanistan's Agromet Bulletins from these sites:

<http://www.agriculture.gov.af/farsi/weather.htm>

<http://afghanistan.cr.usgs.gov/agro.asp>