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USDA Foreign Agricultural Service

Afghanistan: Crop Progress Report

MY 2010/11

February Summary

February 26, 2010

- (1) The outlook for Afghanistan's MY 2010/11 wheat crop is questionable at the moment, with the vast majority of the crop blanketed by snowcover and hidden from satellite sensors. Prior to the recent widespread February snowstorms, the wheat crop was observed to be in excellent vegetative condition, having benefitted from favorable autumn rainfall and ample January sunshine. The major producing areas of the northwest, north, and northeast all had better than normal crop development. It will take several weeks before much of the previously observable crop will once again be free of snow, so that satellites can provide measurable assessments of crop health and development. March-May are critical months for the annual wheat crop in Afghanistan. This is when the bulk of the crop exits winter dormancy and substantial vegetative growth occurs. Favorable spring rainfall and a gradual snowmelt during this period would act to enhance crop production potential, whereas dry conditions and a rapid melt would reduce it. Low winter snow accumulation represents the key threat to the wheat crop at this point. Snowpack levels as measured by NASA's MODIS satellite are currently well below normal in the central and southeastern regions, as well as parts of the northwest. Irrigated wheat in those areas normally contributes 23 percent of Afghanistan's total annual production.
- (2) Cumulative rainfall was very favorable from September-December in most major grains producing regions (northwest, north and northeast), enabling farmers to plant their crops in a timely manner and for soils to build up modest amounts of stored moisture for seed germination and early growth. These unusually favorable rains created one of the best starts to the wheat growing season in many years. The weather pattern changed in Mid-December and dry warm conditions prevailed through January. These unfavorable conditions resulted in well-below normal seasonal snowfall, at a time when maximum winter accumulations are expected. The weather pattern shifted again to a wetter regime in late-January and February, resulting in renewed snow accumulation and a generally favorable seasonal moisture situation nationwide (Figure 1). The exceptions to this were in the west central and extreme southwestern regions. Normal or better than normal total seasonal precipitation has occurred over all major grain producing areas with the exception of portions of Faryab, Sar-e Pul, Bamyan, and Ghor (Figure 2). Temperatures have been well-above normal in recent weeks, and continue to be seasonably high throughout the country at the time of this report (Figure 3).
- (3) Satellite-derived vegetation index (NDVI) data analysis is not able to be performed over the majority of crop areas this month owing to croplands being covered by snow. However areas that are visible in the Northwest and Southwest regions indicate favorable vegetative conditions, with exceptions being Badghis province and several producing areas in the East

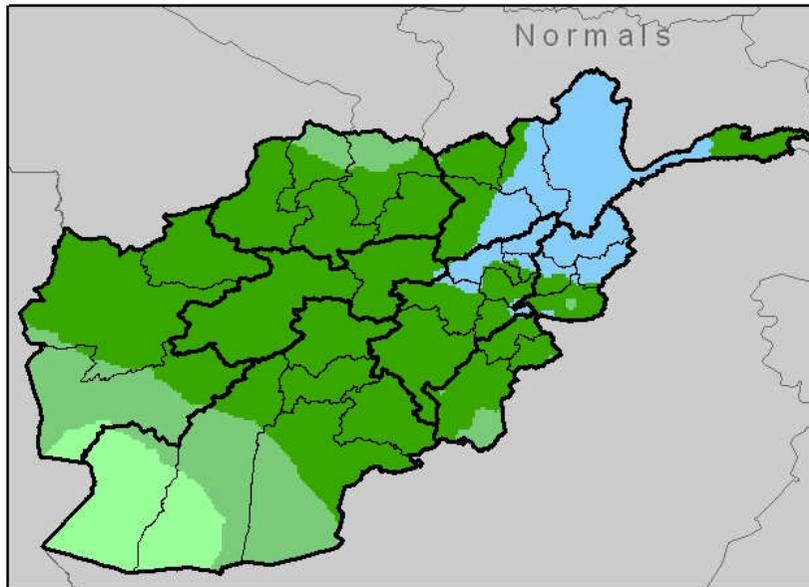
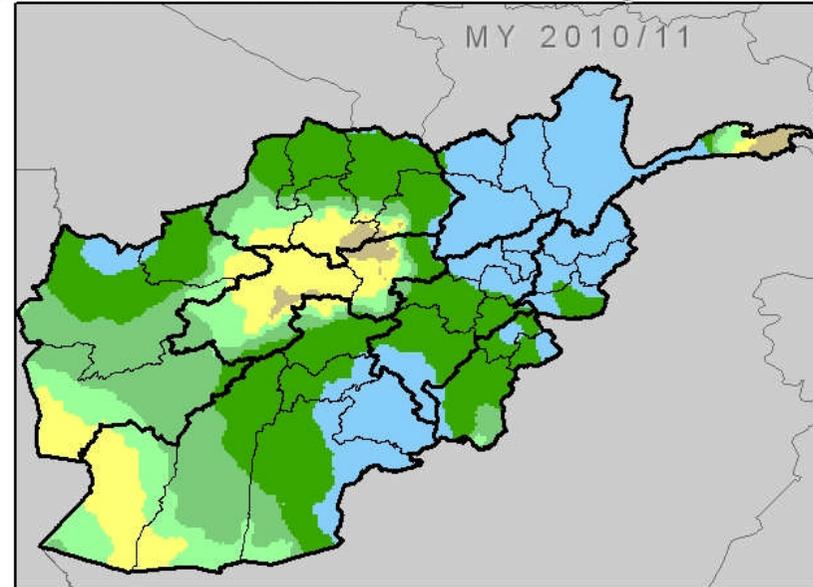
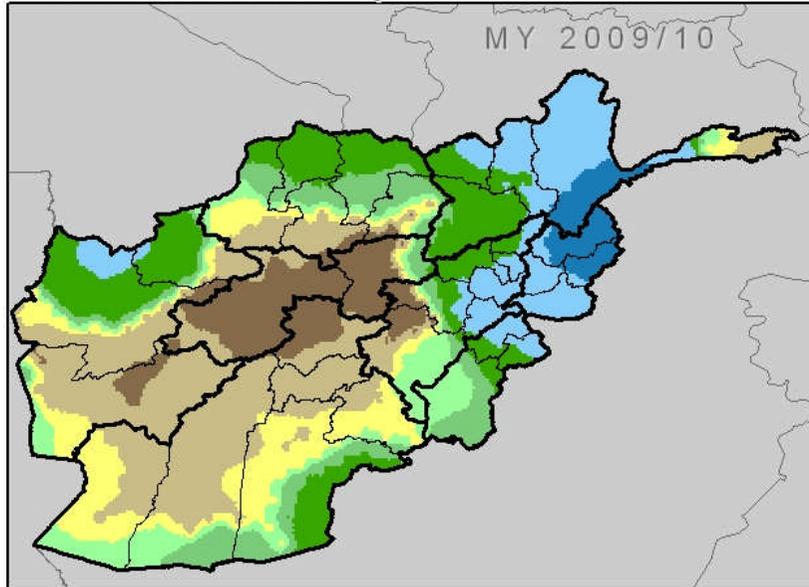
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(Figure 8). In January, when snow cover was lower, NDVI data indicated that the MY2010/11 wheat crop was better developed than both last year and the 6-year average in all major grain growing areas except the Eastern regions. Figures 9 through 24 show current regional level NDVI analysis of wheat crop conditions. The NDVI analysis indicates that crop development in Badghis province is well behind last year and the 6-year average; crops in Laghman, Khost, Kunar and Nargarhar provinces are performing similar to the 6-year average but worse than last year; irrigated crops in Khost are worse than both last year and average. In comparison, NDVI data indicate that irrigated agriculture in Herat, Farah and Helmand provinces (responsible for 14% of national wheat) are all performing relatively better than both last year and the 6-year average. It is important to note that these assessments are very preliminary, and are being conducted prior to the bulk of the crop breaking dormancy and entering strong vegetative growth phases. The best NDVI evidence of crop production potential occurs during peak crop growth during the months of March and April (Figure 4).

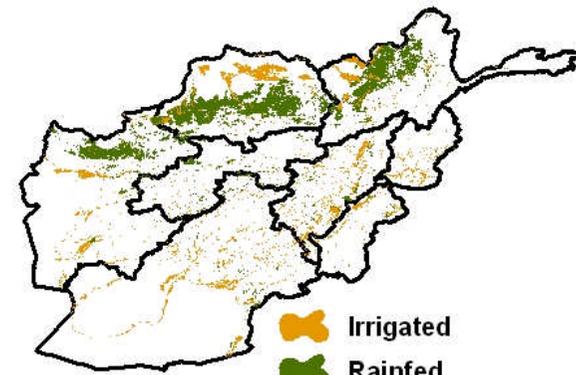
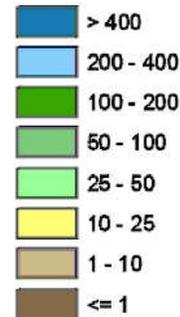
- (4) An extremely low winter snowpack in January 2010 caused a great deal of concern over Afghanistan's upcoming MY2010/11 wheat crop prospects, as 70 percent of national production emanates from irrigated farmland and snowmelt is the primary source of irrigation water supply. Fortunately, a couple of moisture laden weather fronts moved through the country in late January and February, bringing above-normal precipitation and heavy snowfall to much of the country. By mid-February, snow blanketed most crop areas in the country, and snowpack levels were replenished in many important regions. Snow covered area in mid-February 2010 is nearing levels achieved in 2008, which was the highest accumulation in the previous 5 years (Figure 29). However, snow depth analysis indicates that the current snowpack is still below normal, particularly in the west central, central, and south regions (Figures 28). An estimated 88 percent of irrigation water supply for crop production in Afghanistan is derived from the surface water that flows through the country's river basins, and both surface and ground water recharge in the country is directly linked to spring snow melt out of the Hindu Kush Mountains. Water availability for crop production is a factor of the amount available through snow melt (snow water equivalence) and the rate of snow melt. Annual snow accumulation in Afghanistan peaks in early March.
- (5) Medium resolution satellite imagery comparisons of current conditions against previous years tell similar stories to the NDVI analysis. Near normal conditions appear near Kunduz, though very little visible crop development has occurred by early February (Figure 25). The large dark cropping zone highlighted in the images will fill-in with wheat crop vegetation in coming months. Worse than normal vegetation conditions are evident in the irrigated areas of Khost province (Figure 26). It appears that wheat planted area is similar to last year, but crop development may be behind schedule, resulting in a lower NDVI at this point of the crop growth cycle. Figure 27 highlights crop conditions over Helmand province along the Helmand River. It showed that wheat crop development was near-normal in mid-January.
- (6) The NOAA Climate Prediction Center's 7-day rainfall forecast indicates additional moderate to heavy precipitation will occur over the entirety of Afghanistan, with substantial accumulations occurring in central and northwest regions (Figure 31).

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Cumulative Precipitation: Grains Season to date Oct. 1, 2009 - February 20, 2009



Precipitation (mm)



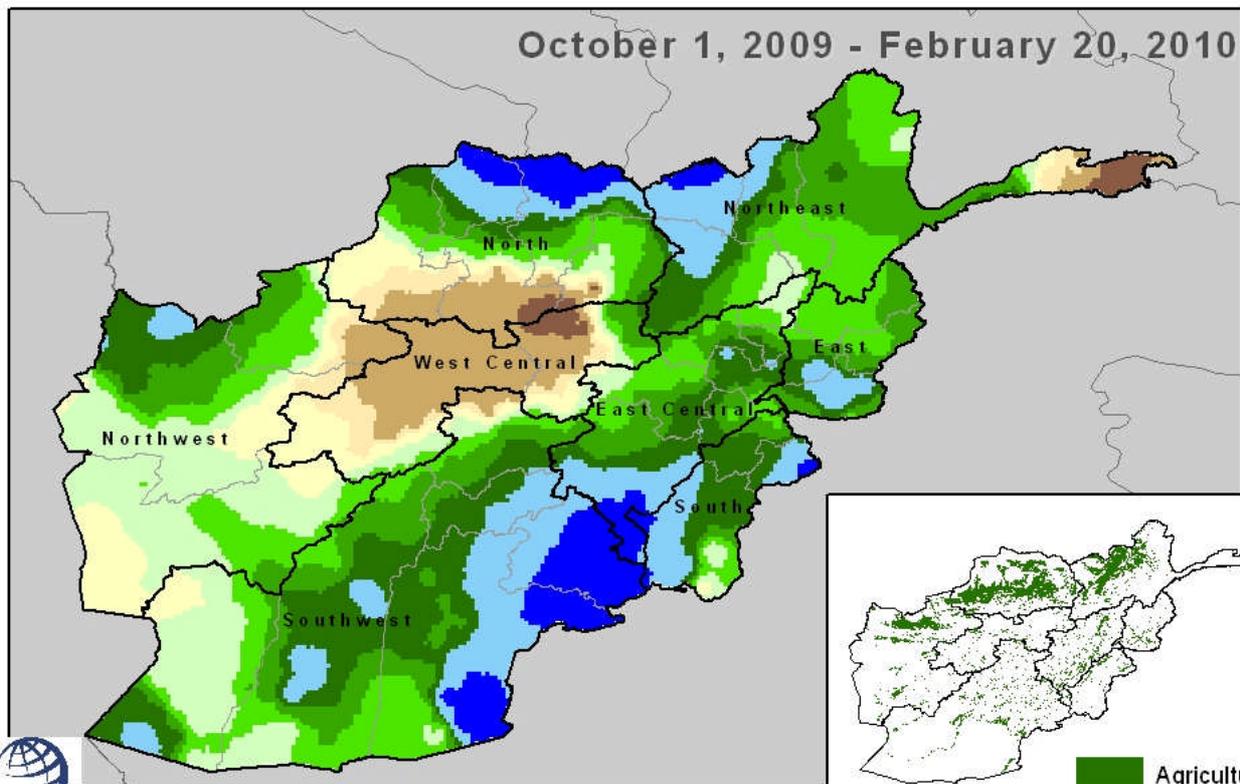
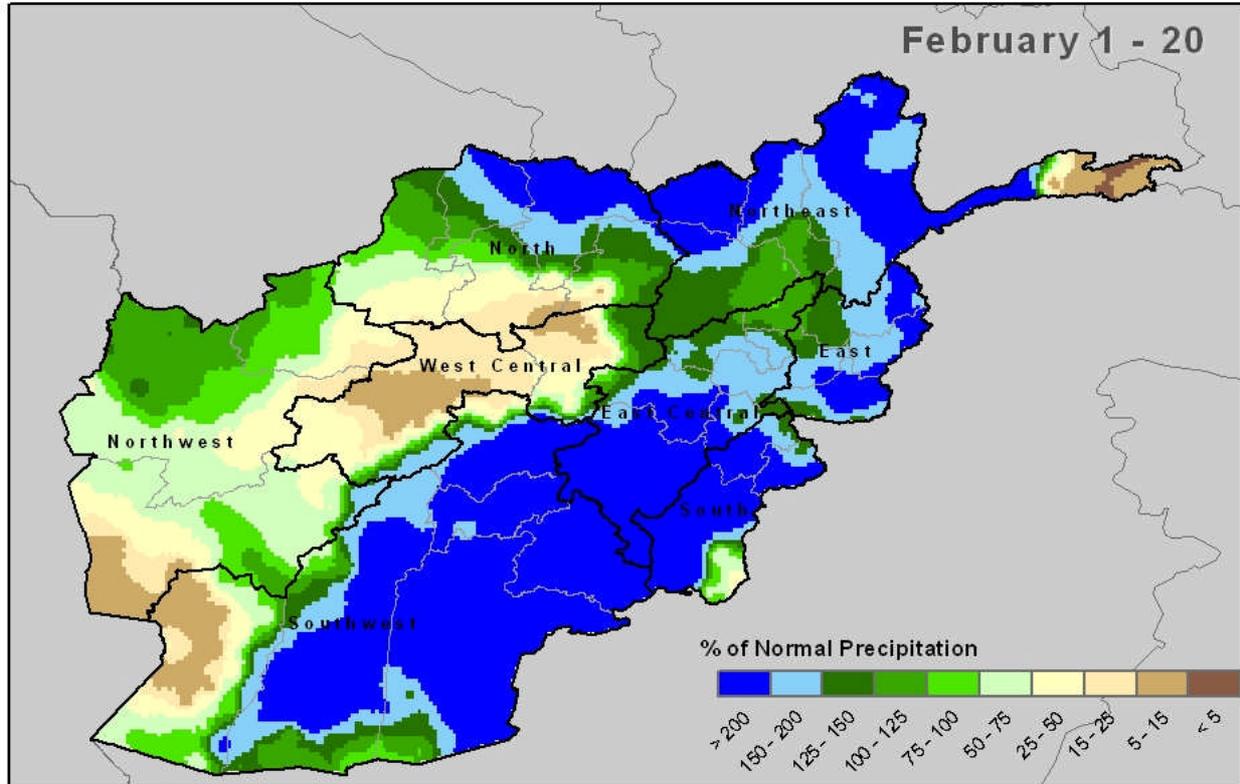
Location of Agriculture

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Figure 1. Season to date cumulative precipitation showing current year (MY 2010/11) compared against the previous years and precipitation normals.

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Percent of Normal Precipitation



Data Source: AFWA Precipitation
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer

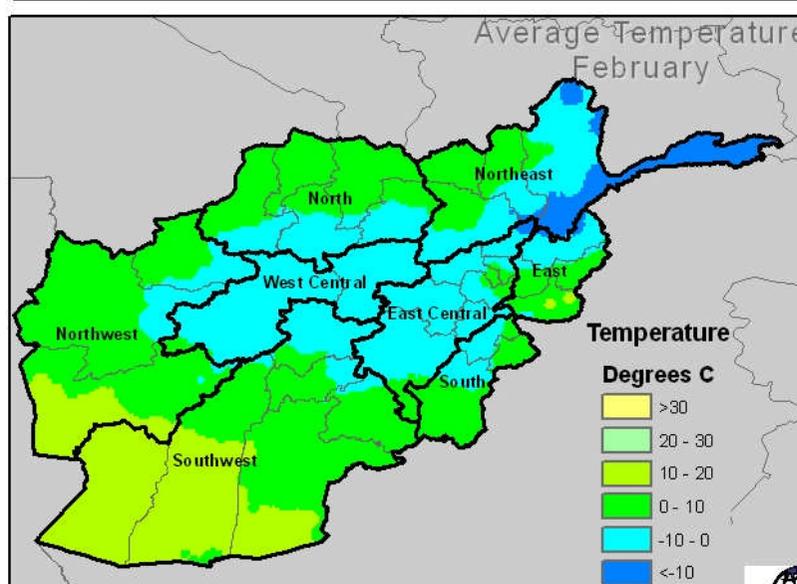
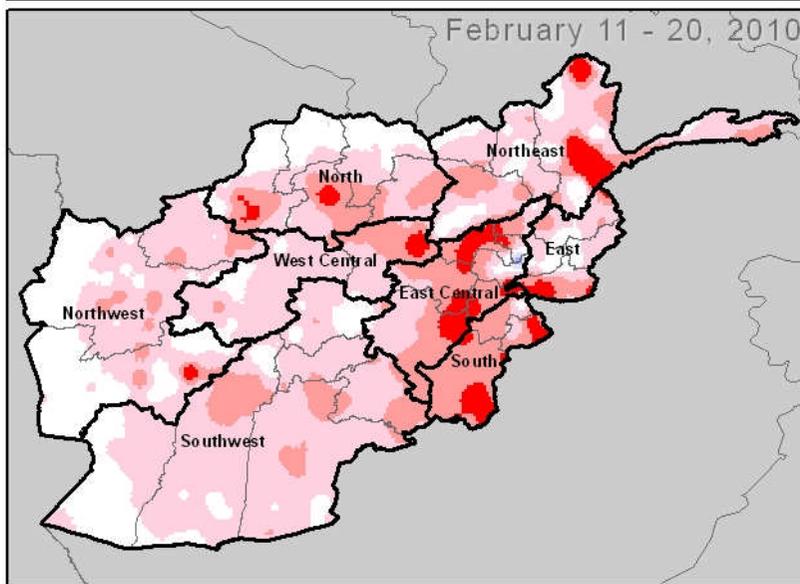
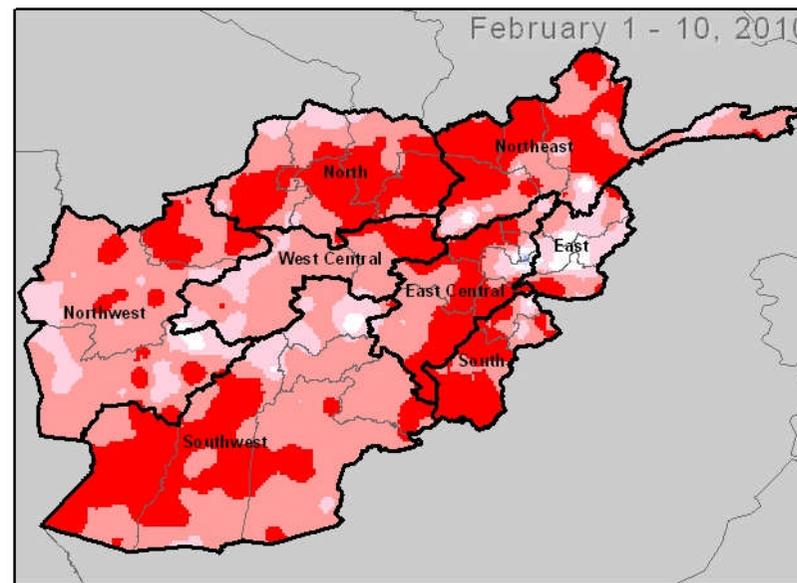
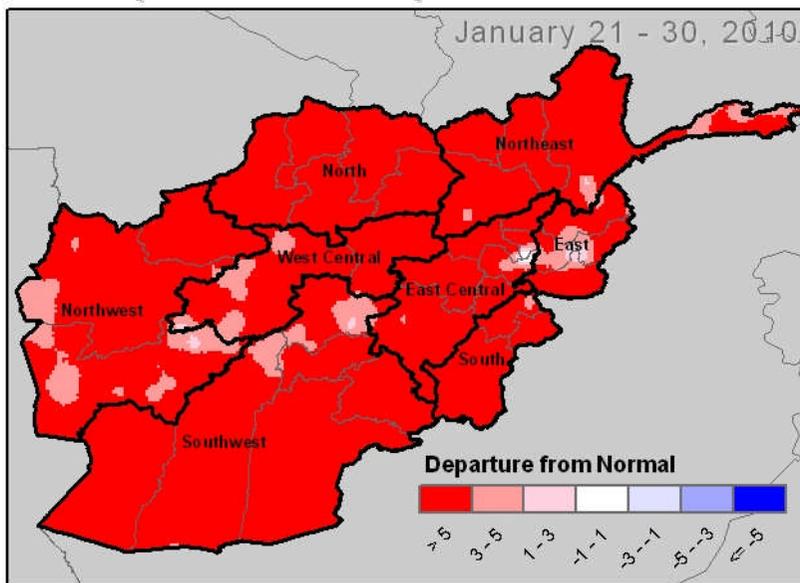
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Figure 2. Percent of normal precipitation showing the current month and winter grains season to date.

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Temperature Departure from Normal: Jan. 21 - Feb. 20, 2010



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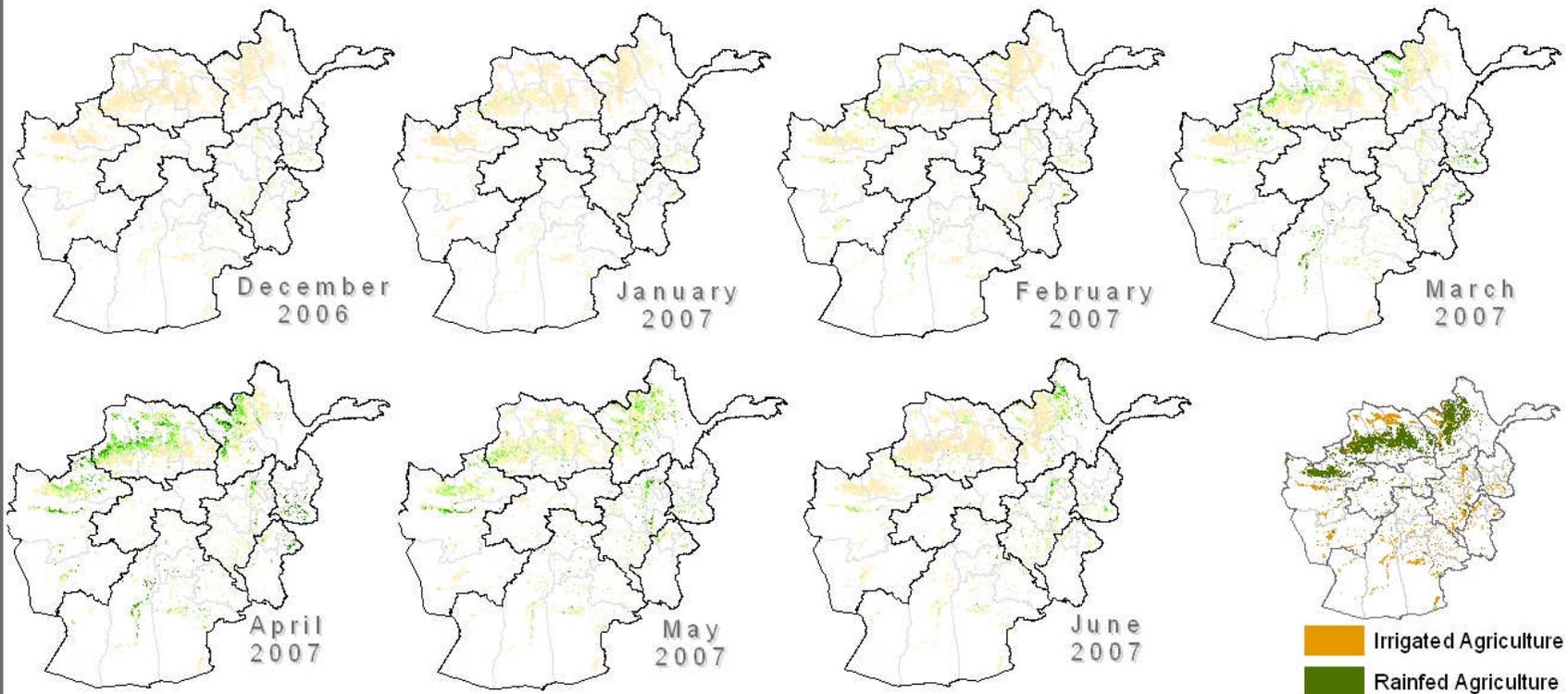
Figure 3. Decadal temperature departure from normal from January 20, 2010 to February 20, 2010

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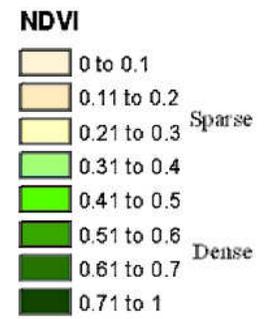
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MODIS NDVI Time Series: MY 2010/11 vs. MY 2007/08 Benchmark

MY 2007/08 - BENCHMARK



MY 2010/11 - CURRENT



Data Source: MODIS NDVI
 University of Maryland
 USDA/FAS/OGA/IPAD

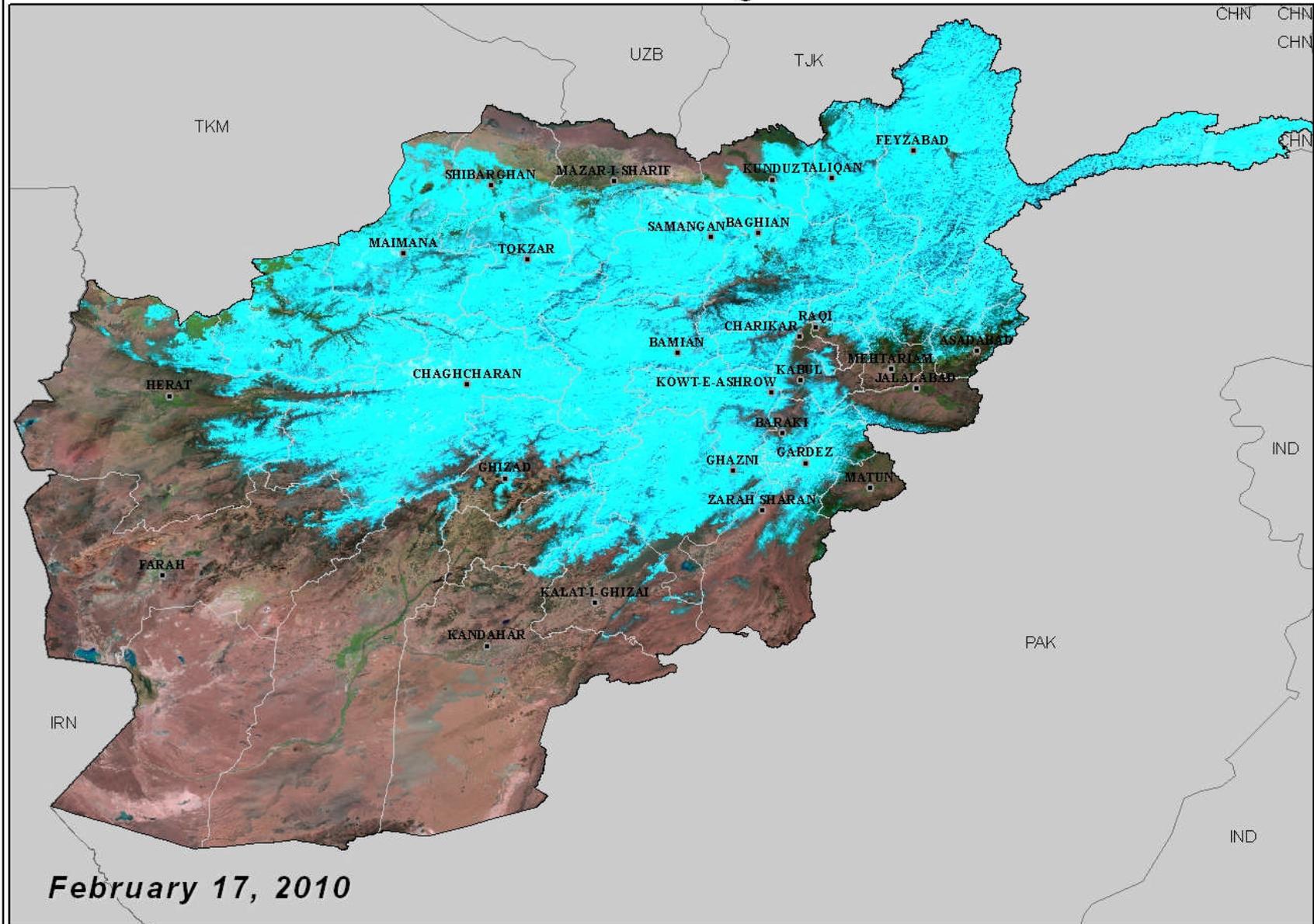
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Figure 4. MODIS NDVI images over the winter grains season comparing MY 2007/08 benchmark grain production year to the current season.

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MODIS 721 False-Color Image: MY 2010/11



February 17, 2010

Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

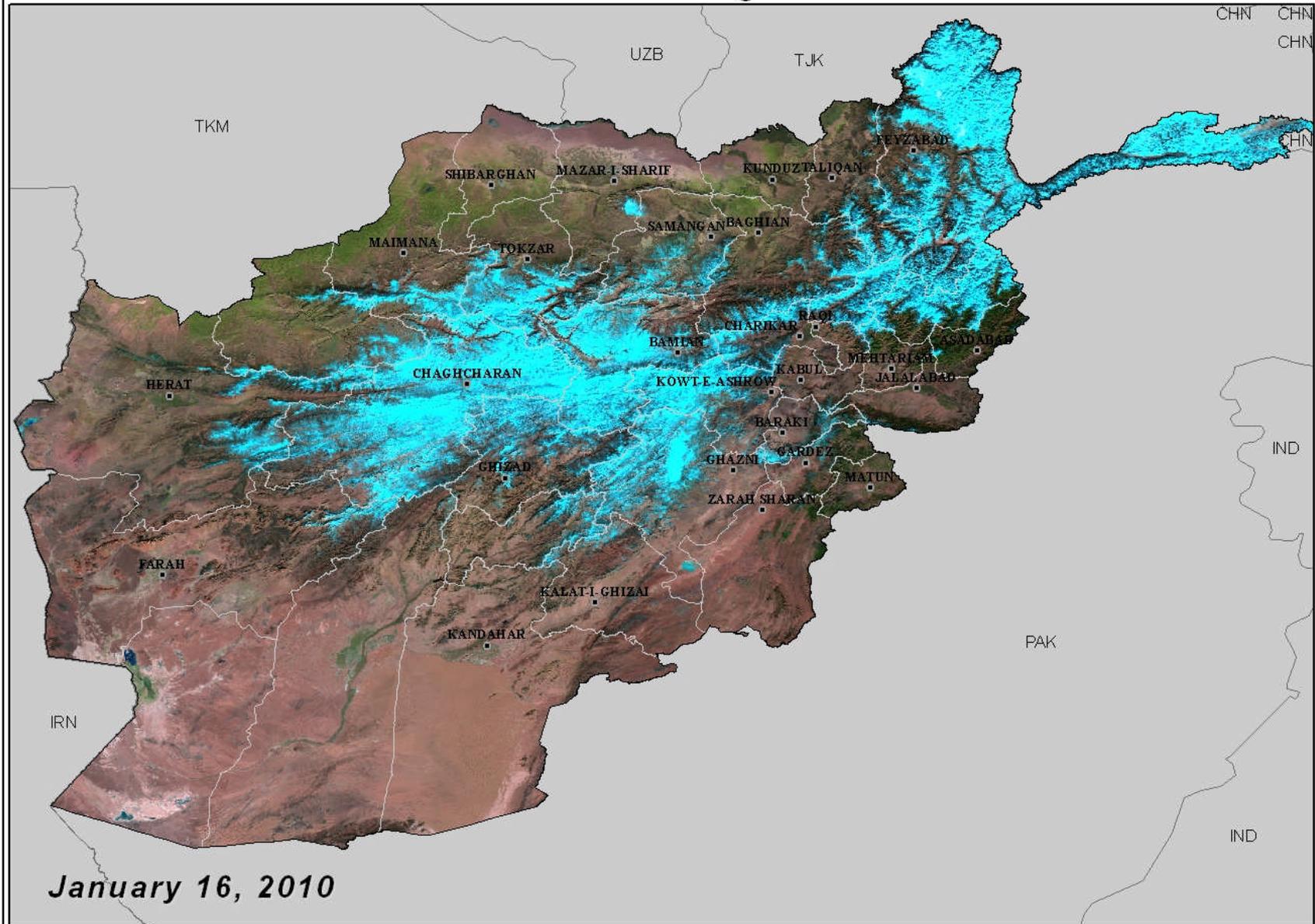
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Figure 5. MODIS false color, cloud free composite over Afghanistan for the current month, February 10-17, 2010

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MODIS 721 False-Color Image: MY 2010/11



January 16, 2010

Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

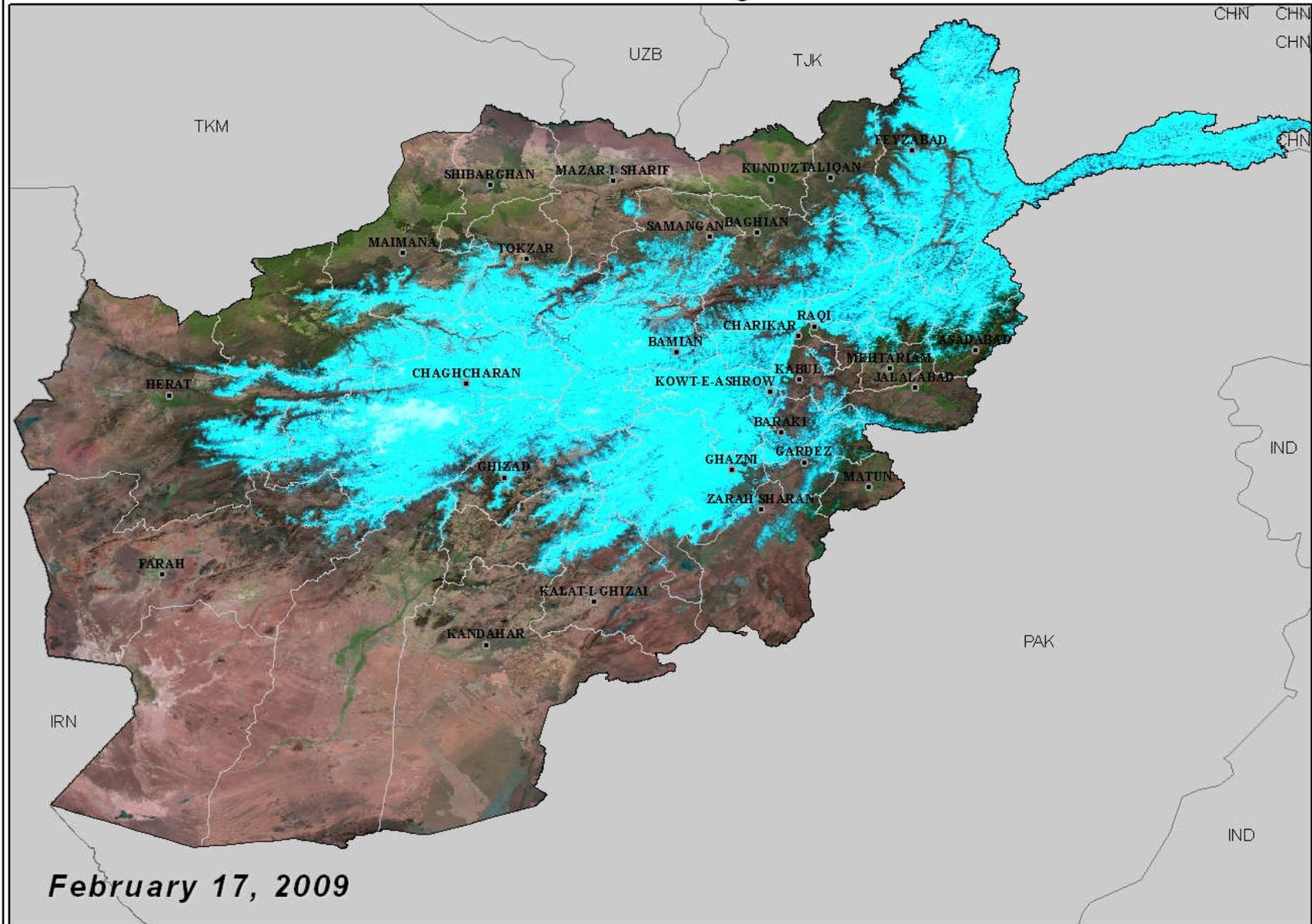
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Figure 6. MODIS false color, cloud free composite over Afghanistan for the previous month, January 9 -16, 2010

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MODIS 721 False-Color Image: MY 2009/10



February 17, 2009

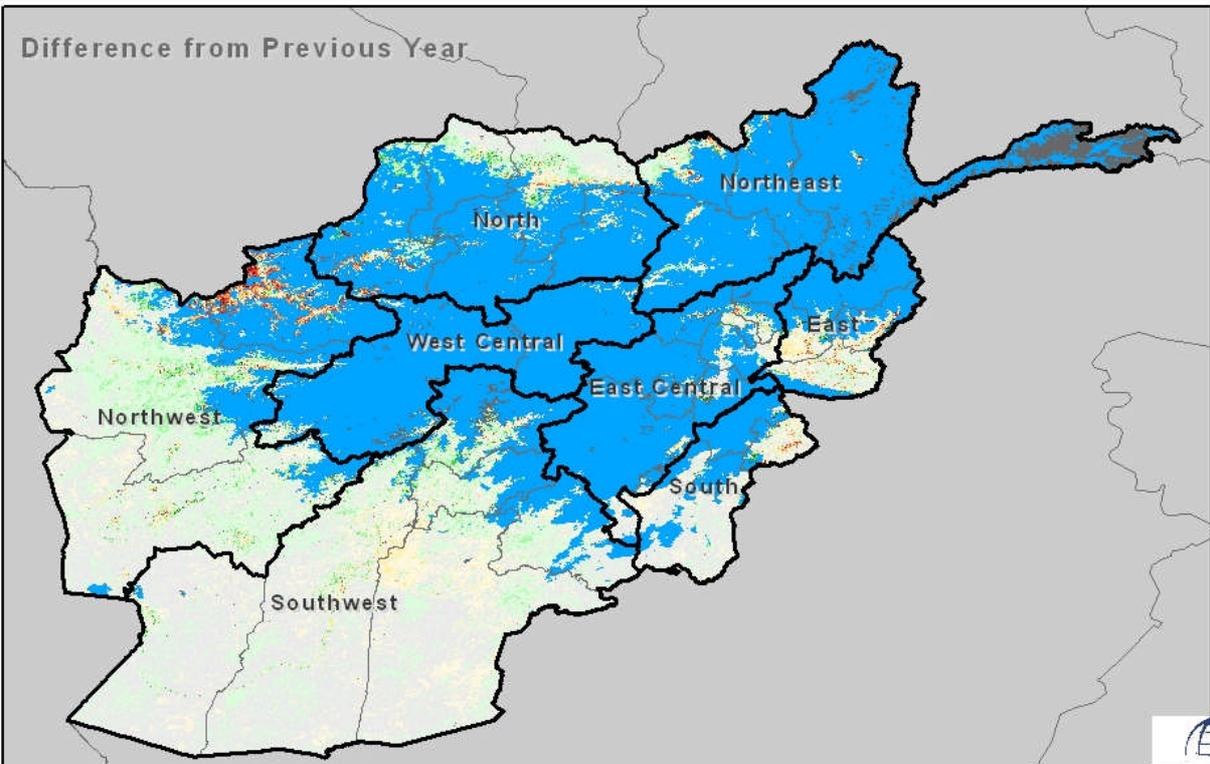
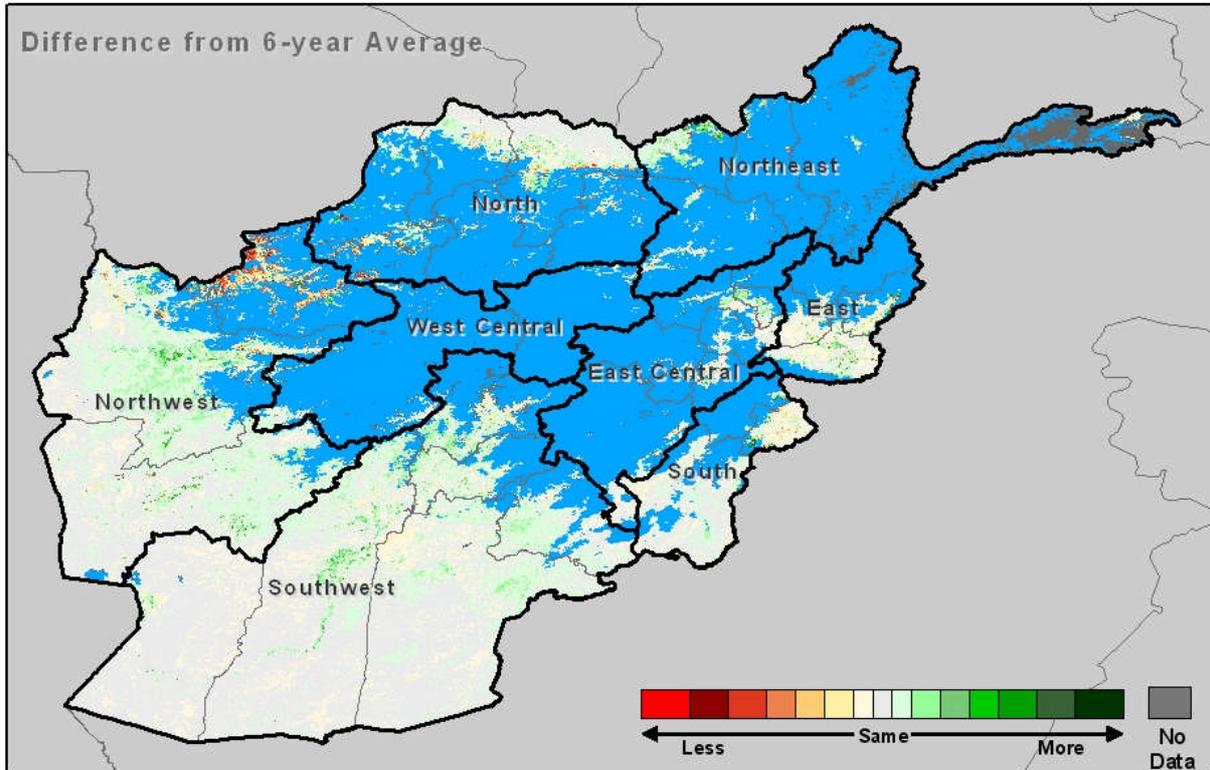
Data Source: MODIS 8-Day 721 Composite
Data Provided by USGS EROS Data Center/ NASA Goddard
Supporting: USDA/FAS/OGA/IPAD

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Figure 7. MODIS false color, cloud free composite over Afghanistan for the current month, last year, February 10-17, 2009

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MODIS NDVI Change Analysis: February 17, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer



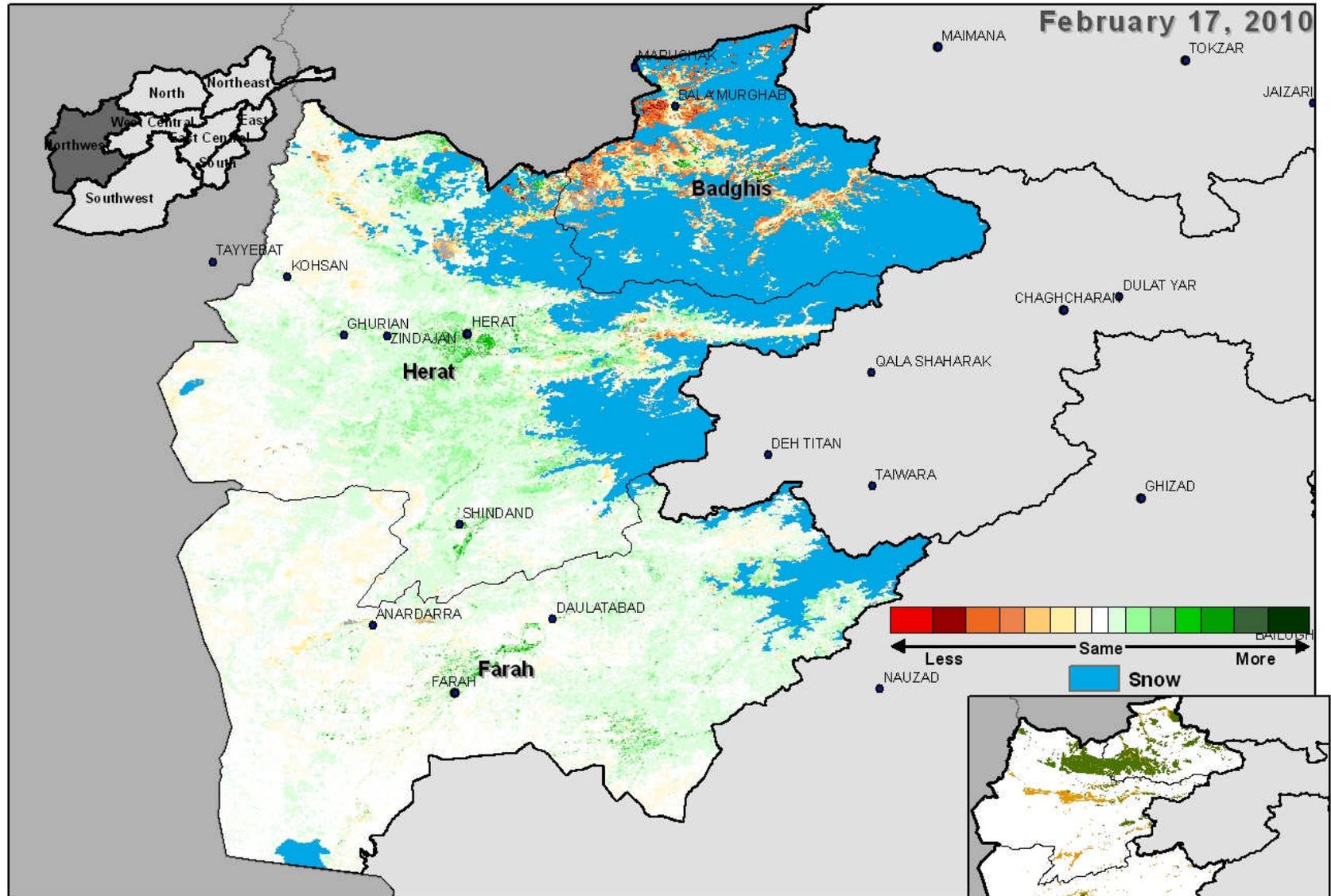
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Figure 8. MODIS NDVI change comparing current MY 2010/11 NDVI against the previous 6-year average and against the previous season (MY 2009/10)

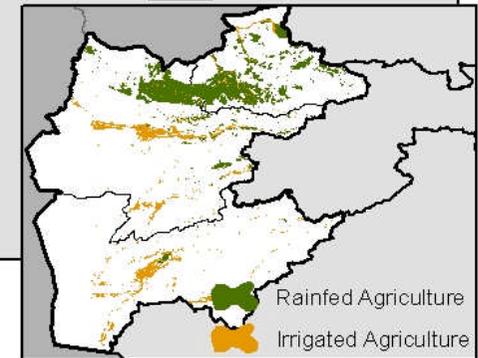
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MODIS NDVI Difference from 6yr Average: Northwest Provinces



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer



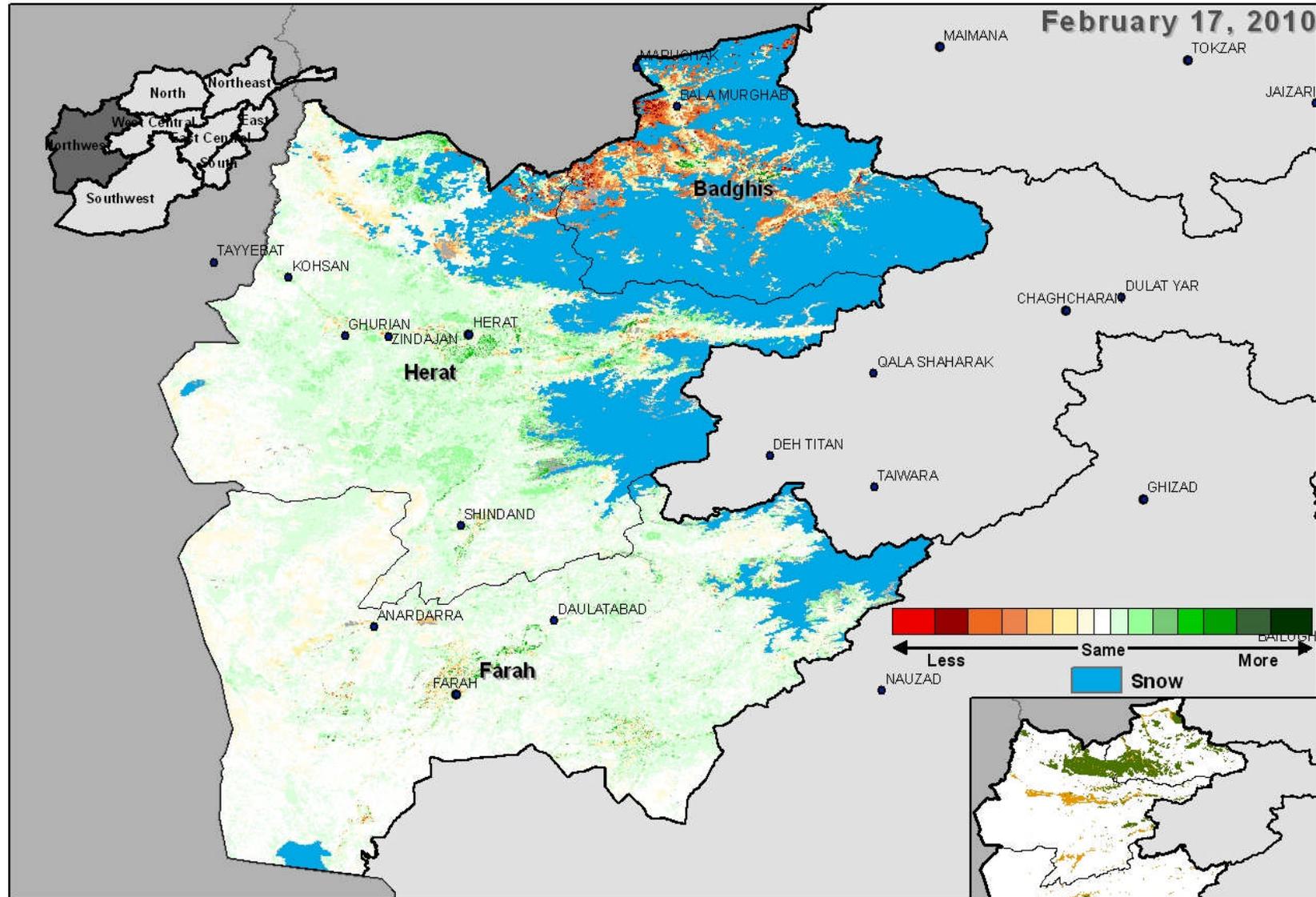
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Figure 9. MODIS NDVI comparing current conditions against previous 6-year average, Northwest Provinces

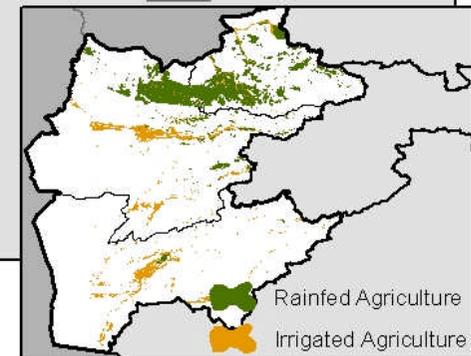
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MODIS NDVI Difference from Last Year: Northwest Provinces



Data Source: MODIS NDVI 250-m, University of Maryland
 USDA-FAS, Office of Global Analysis, IPAD
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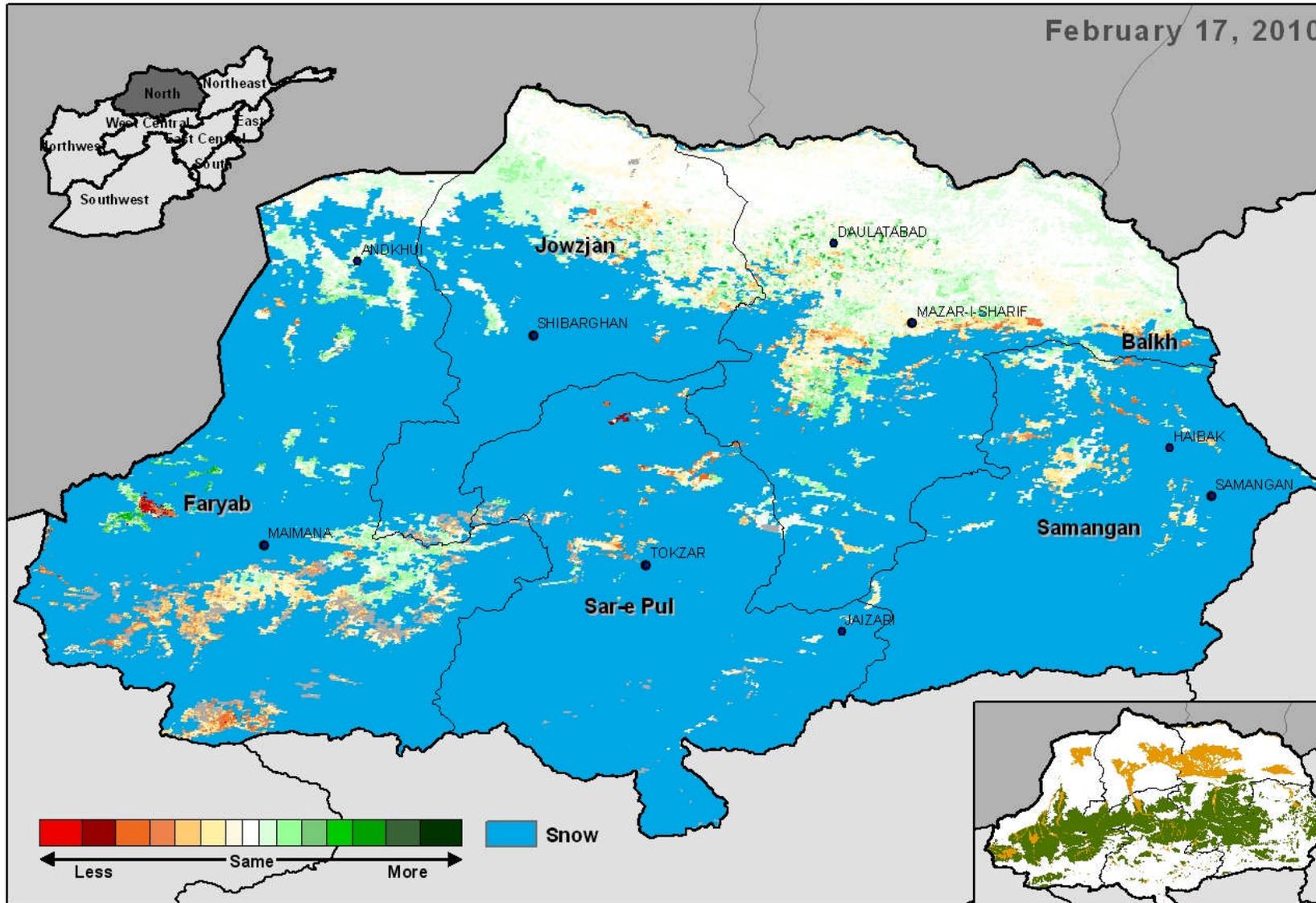
Figure 10. MODIS NDVI comparing current conditions against previous season (MY 2009/10), Northwest Provinces

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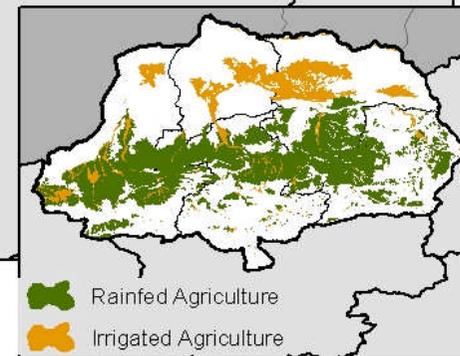
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MODIS NDVI Difference from 6yr Average: North Provinces

February 17, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
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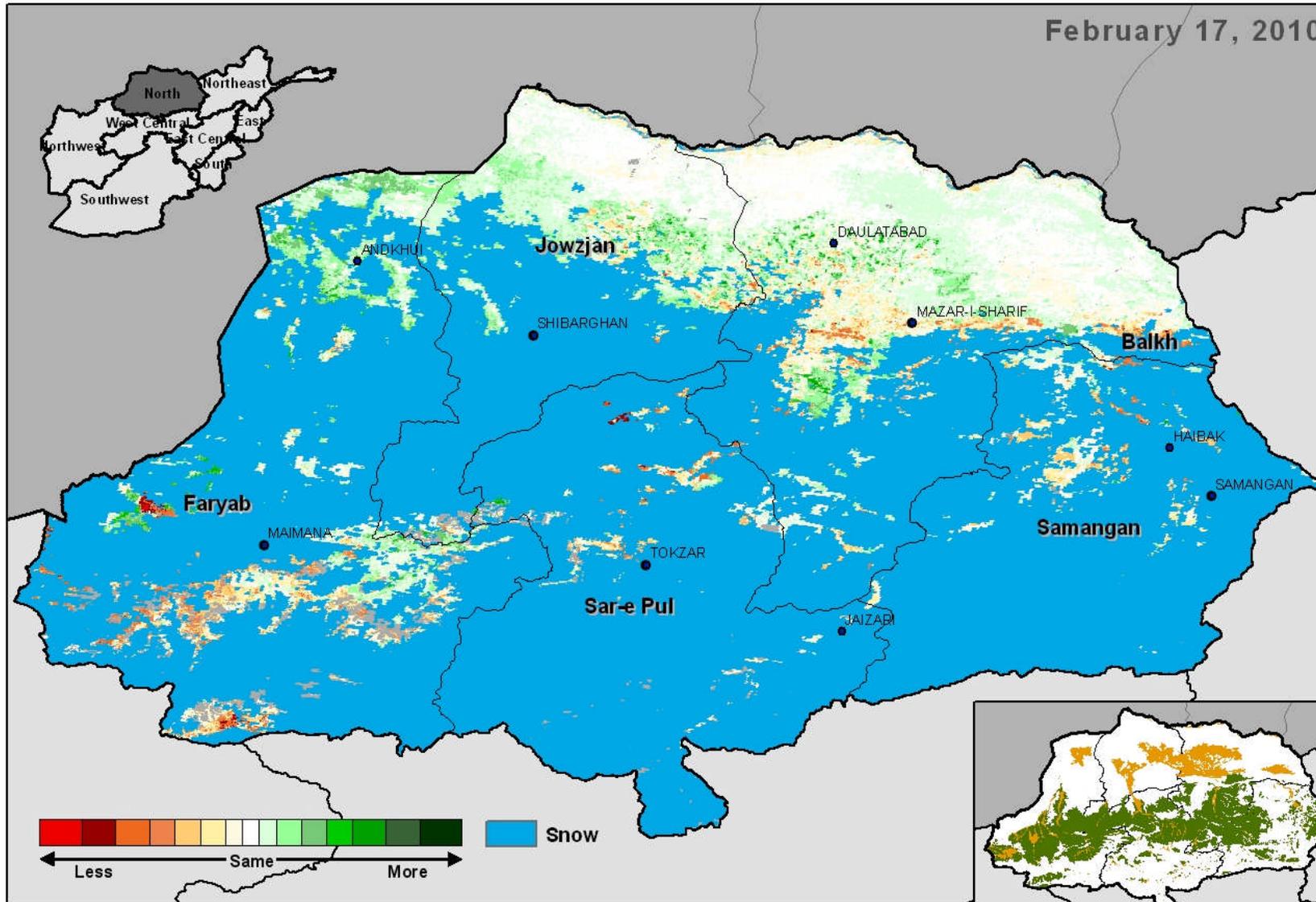
Figure 11. MODIS NDVI comparing current conditions against previous 6-year average, North Provinces

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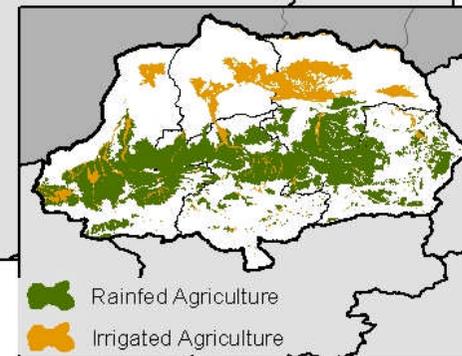
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MODIS NDVI Difference from Last Year: North Provinces

February 17, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
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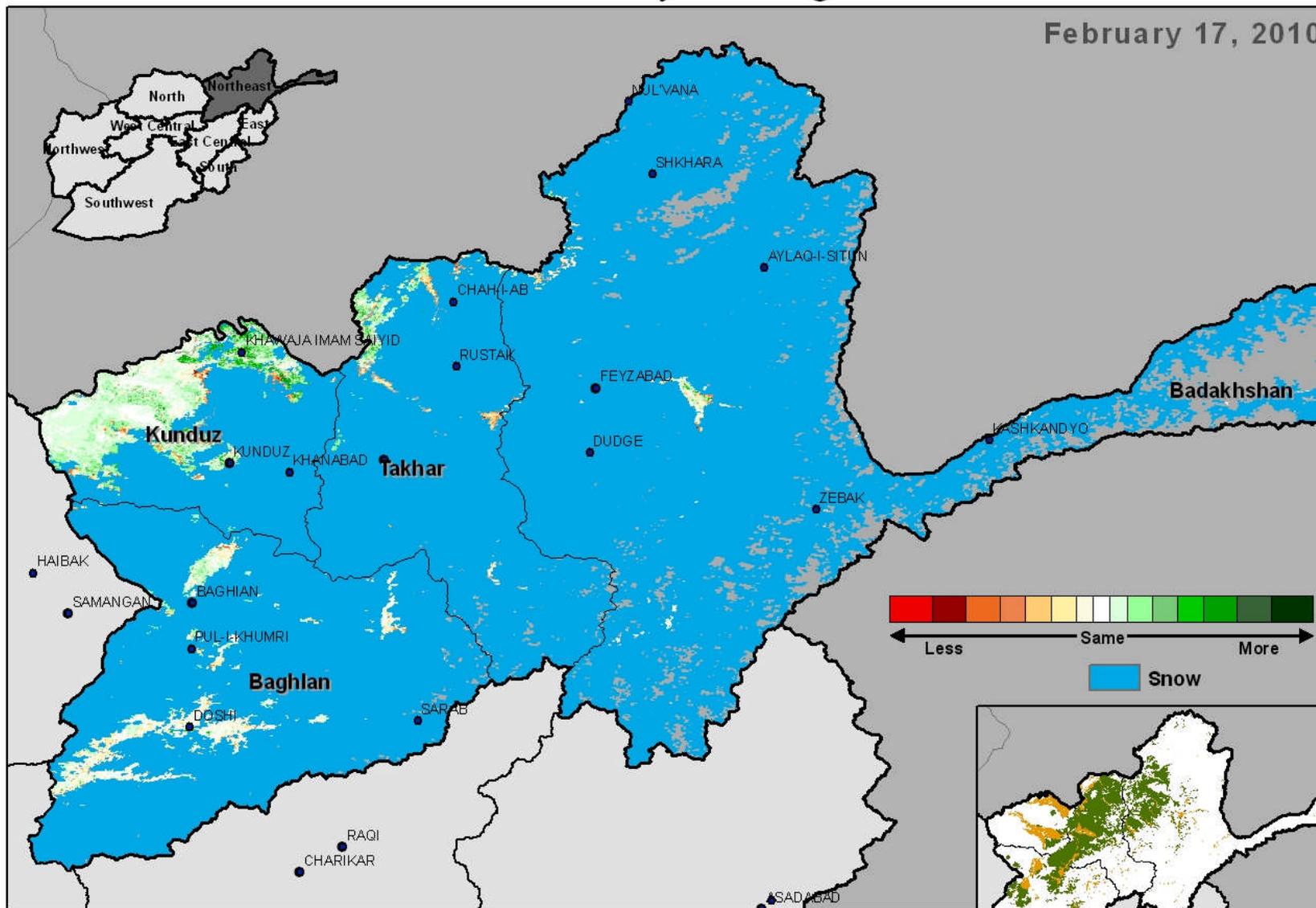
Figure 12. MODIS NDVI comparing current conditions against previous 6-year average, North Provinces

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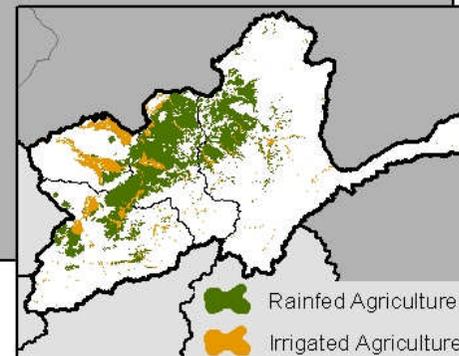
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MODIS NDVI Difference from 6yr Average: Northeast Provinces

February 17, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
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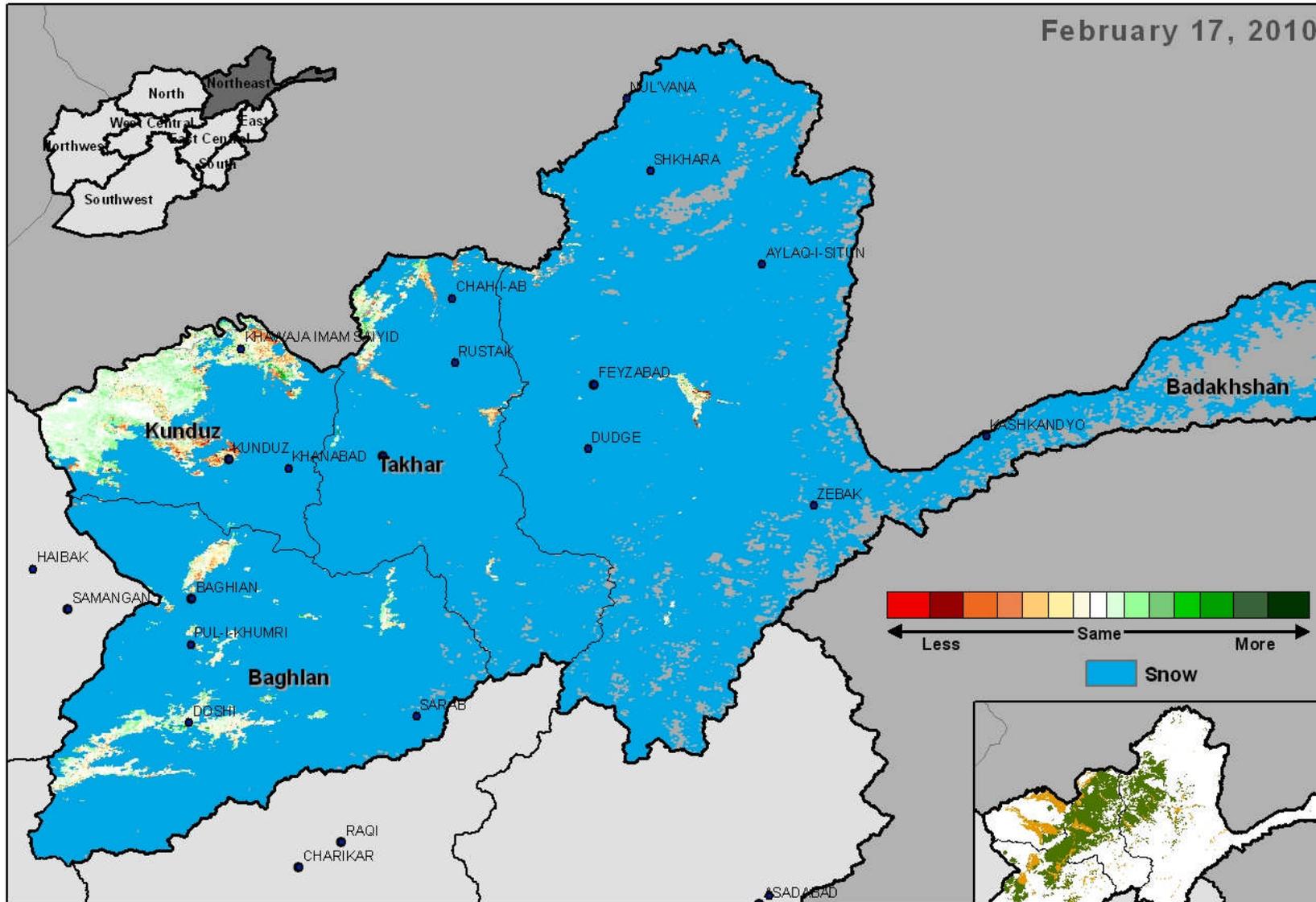
Figure 13. MODIS NDVI comparing current conditions against previous 6-year average, Northeast Provinces

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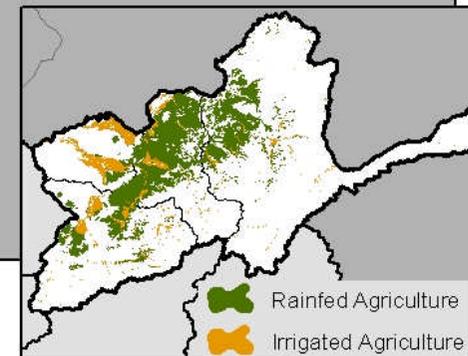
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MODIS NDVI Difference from Last Year: Northeast Provinces

February 17, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
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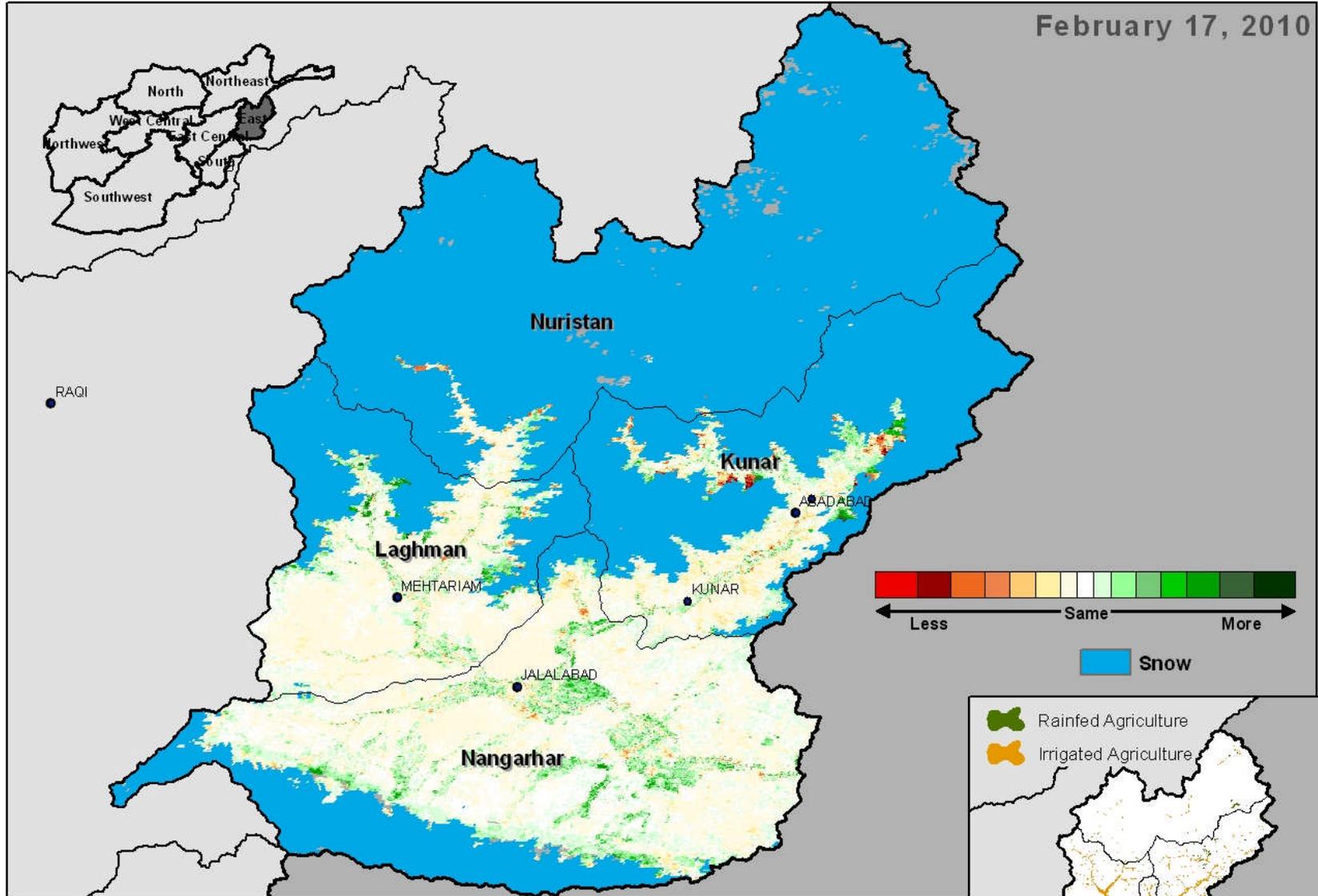
Figure 14. MODIS NDVI comparing current conditions against previous 6-year average, Northeast Provinces

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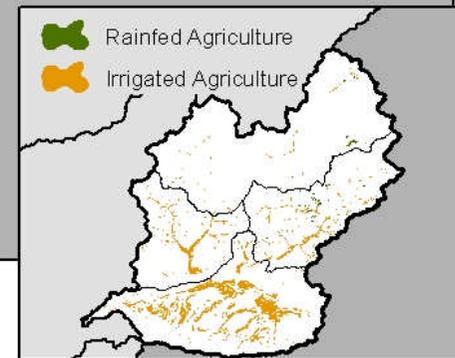
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MODIS NDVI Difference from 6yr Average: East Provinces

February 17, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
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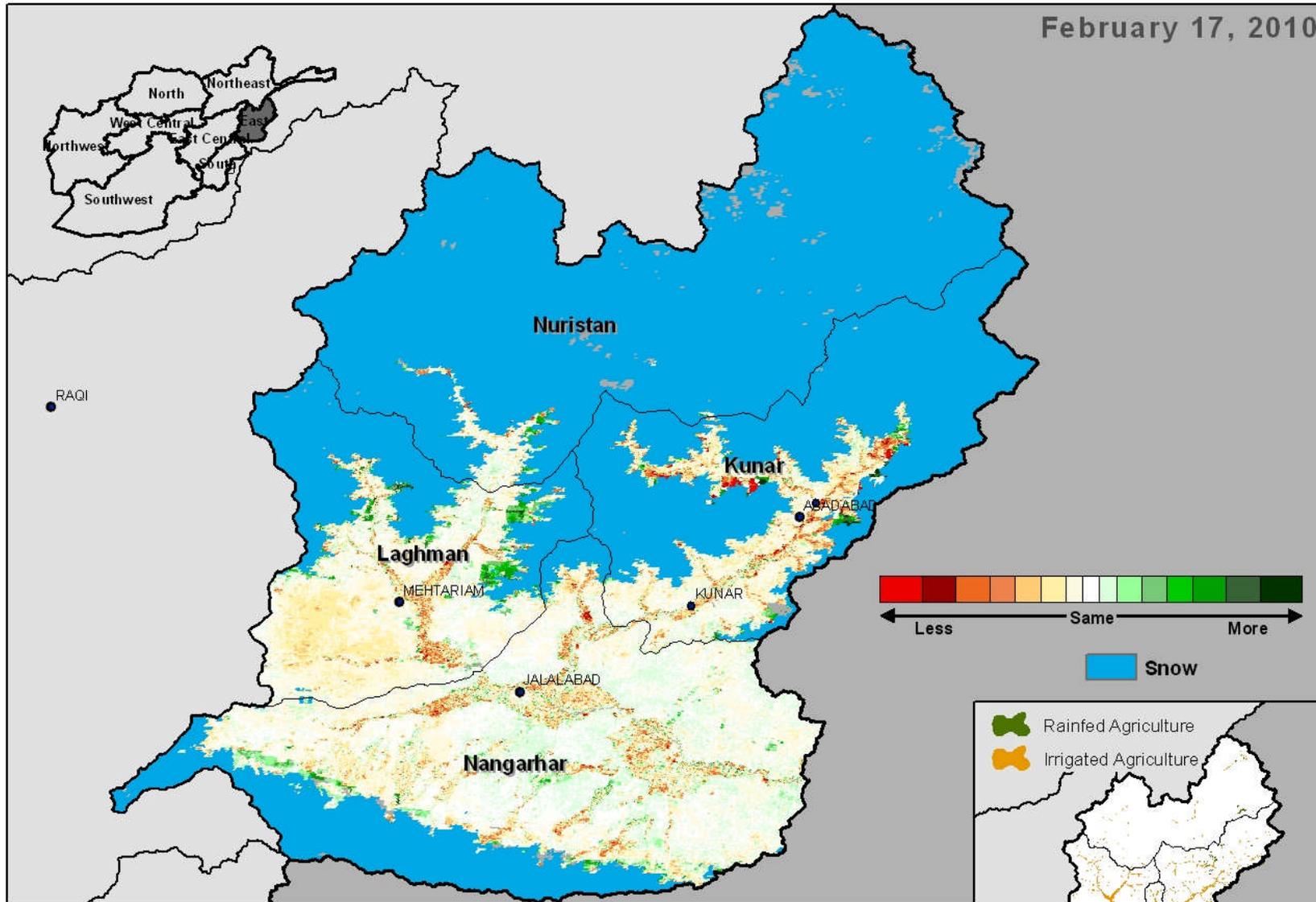
Figure 15. MODIS NDVI comparing current conditions against previous 6-year average, East Provinces

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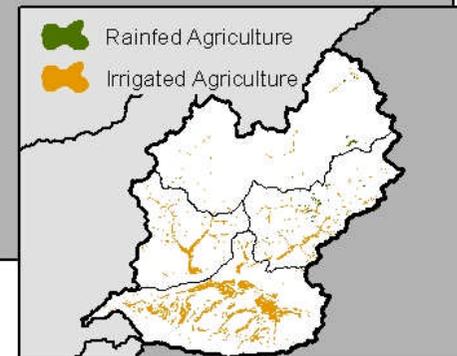
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MODIS NDVI Difference from Last Year: East Provinces

February 17, 2010



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer



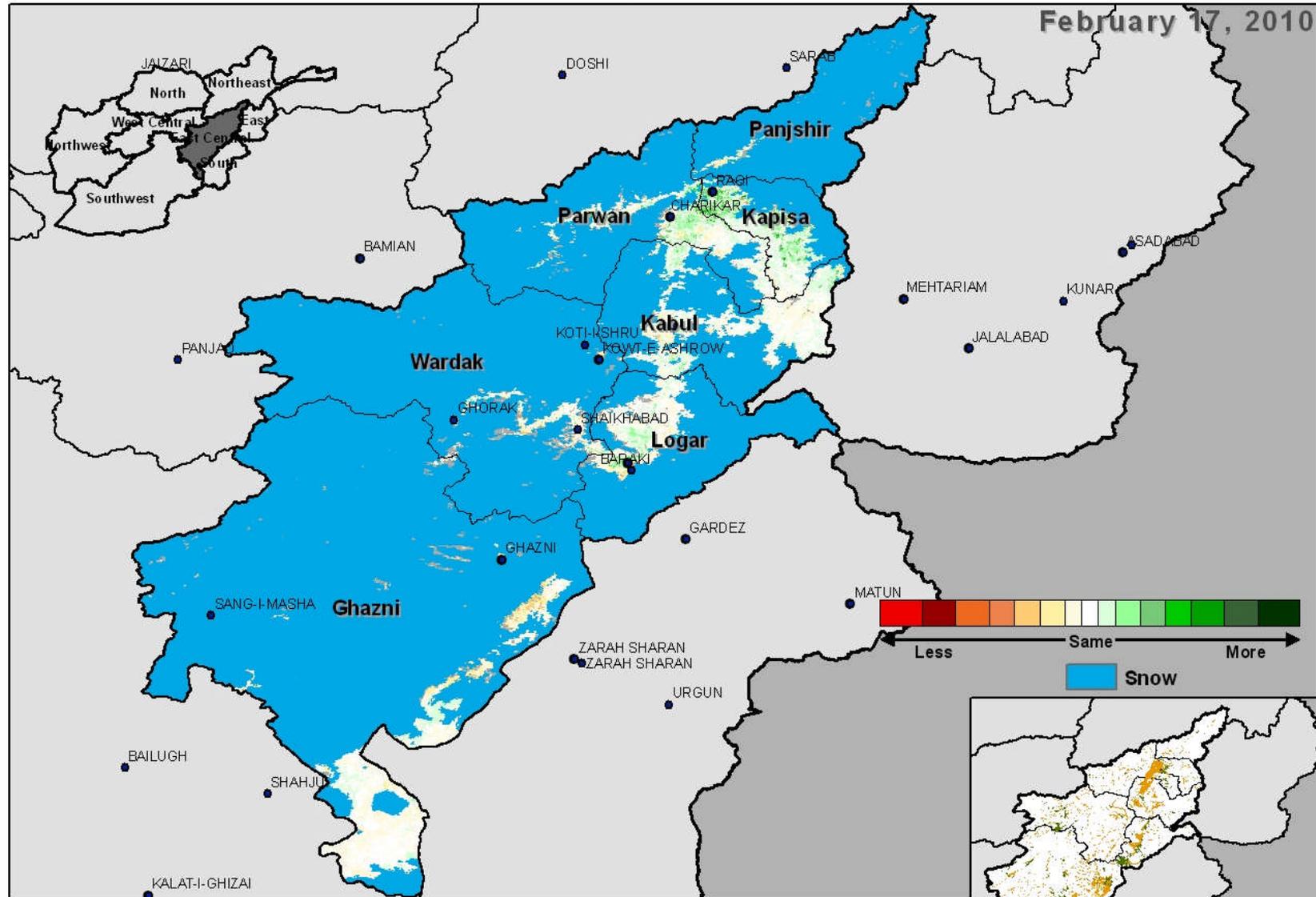
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Figure 16. MODIS NDVI comparing current conditions against previous 6-year average, East Provinces

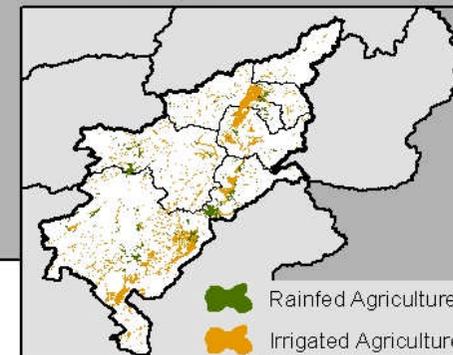
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MODIS NDVI Difference from 6yr Average: East Central Provinces



Data Source: MODIS NDVI 250-m, University of Maryland
 USDA-FAS, Office of Global Analysis, IPAD
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Figure 17. MODIS NDVI comparing current conditions against previous 6-year average, East Central Provinces

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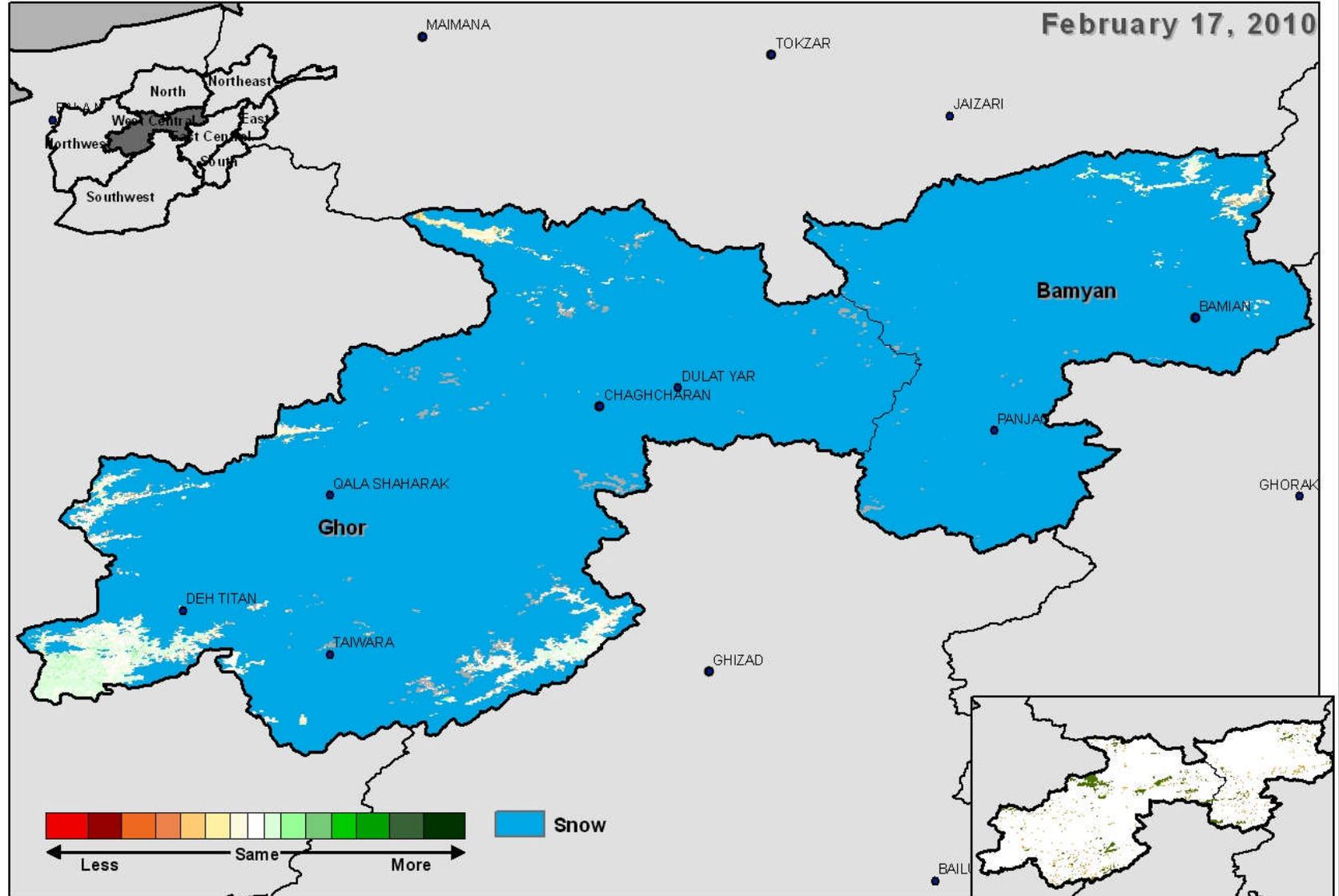
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Figure 18. MODIS NDVI comparing current conditions against previous 6-year average, East Central Provinces

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MODIS NDVI Difference from 6yr Average: West Central Provinces



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer

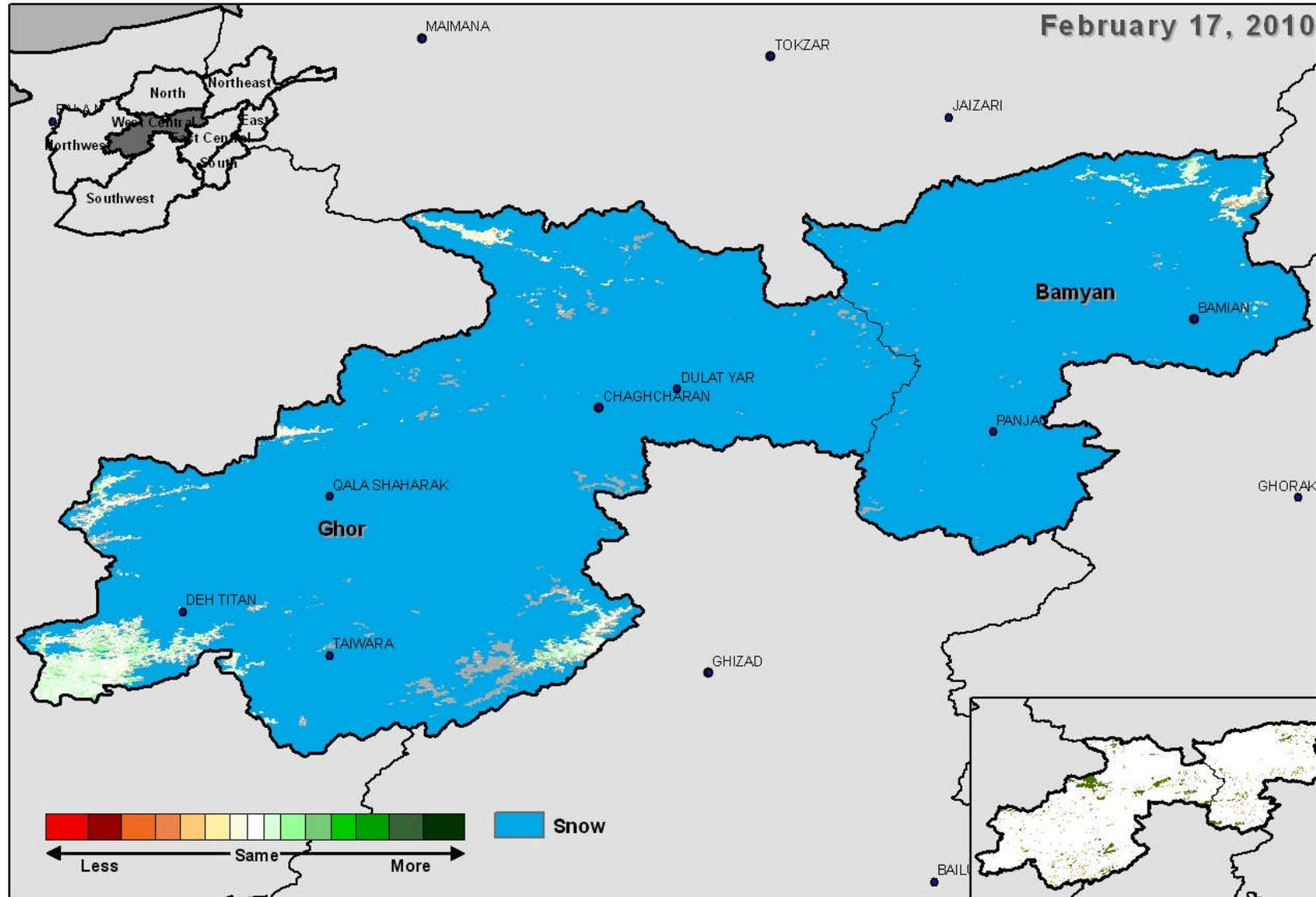
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Figure 19. MODIS NDVI comparing current conditions against previous 6-year average, West Central Provinces

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MODIS NDVI Difference from Last Year: West Central Provinces



Data Source: MODIS NDVI 250-m, University of Maryland
USDA-FAS, Office of Global Analysis, IPAD
Crop Explorer

Rainfed Agriculture
 Irrigated Agriculture

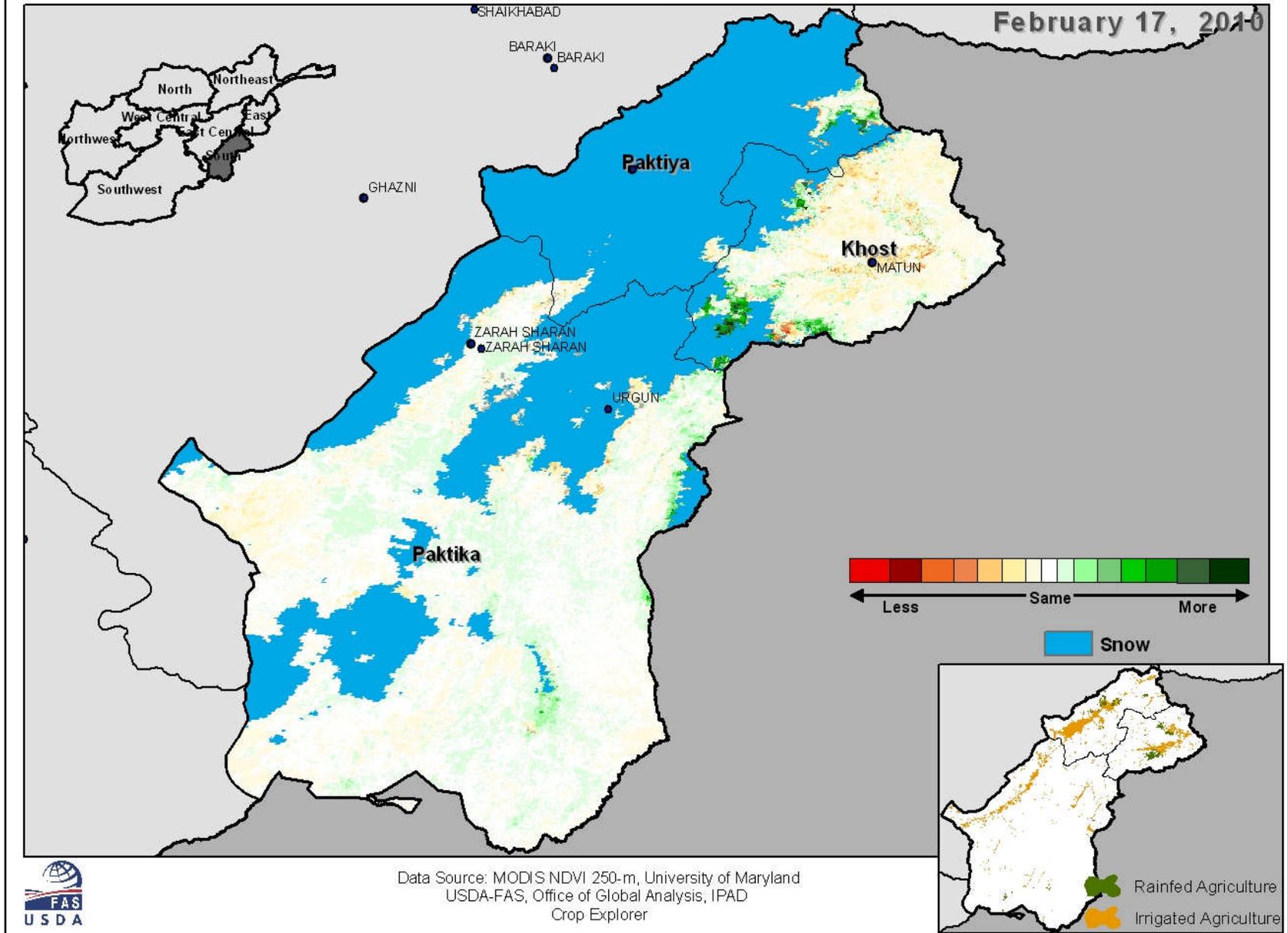
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Figure 20. MODIS NDVI comparing current conditions against previous 6-year average, West Central Provinces

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MODIS NDVI Difference from 6yr Average: South Provinces



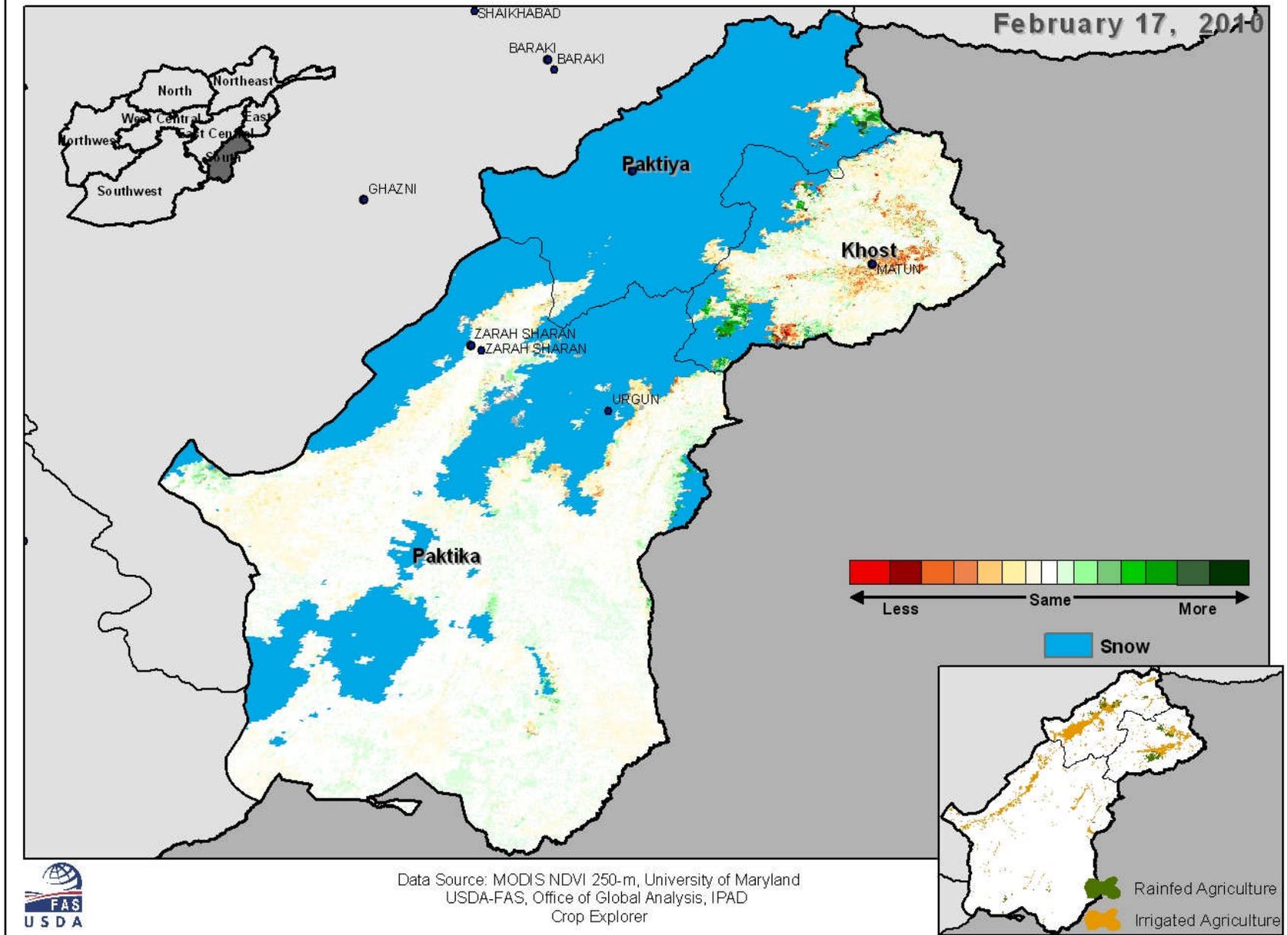
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Figure 21. MODIS NDVI comparing current conditions against previous 6-year average, South Provinces

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MODIS NDVI Difference from Last Year: South Provinces



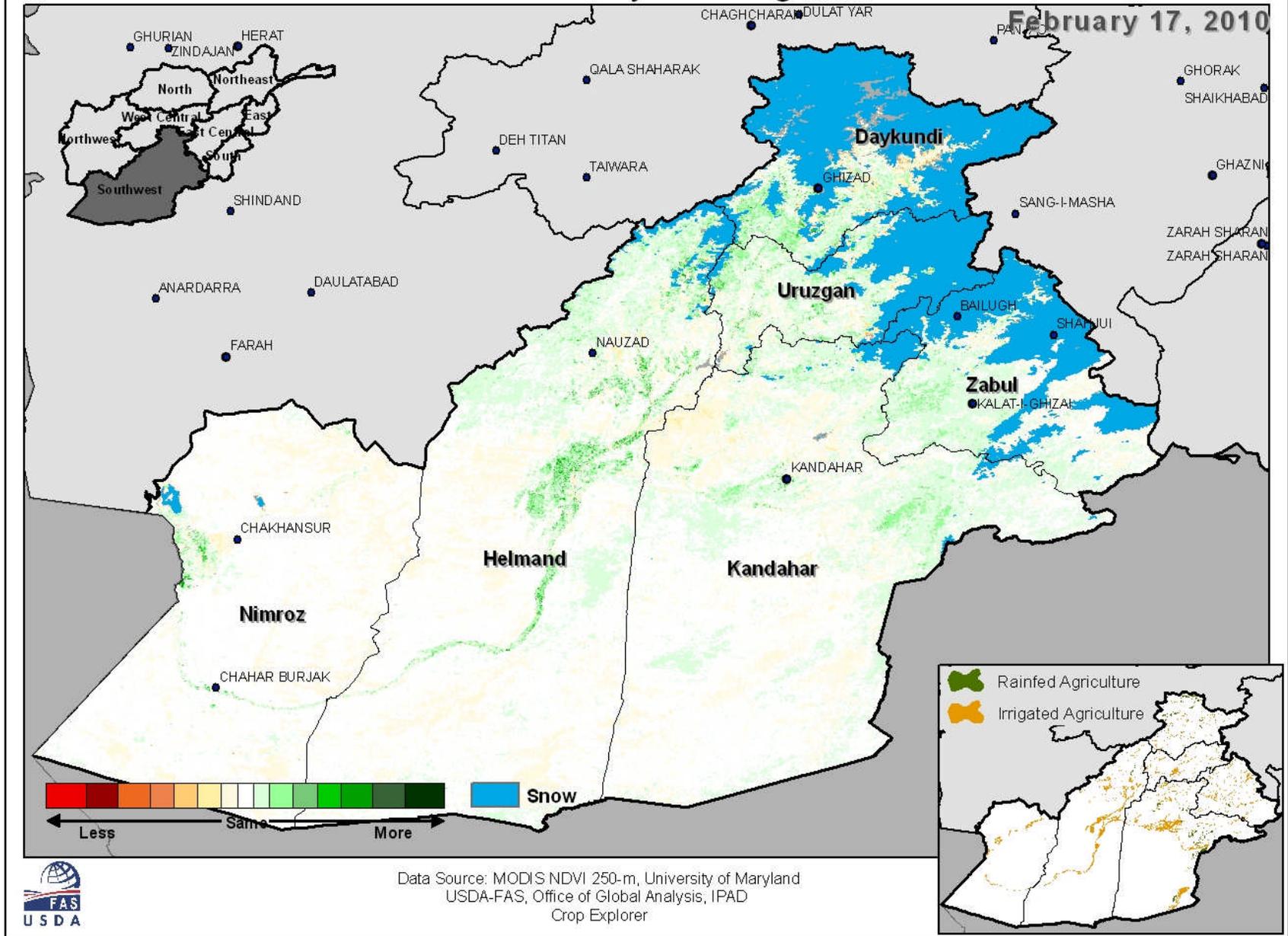
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Figure 22. MODIS NDVI comparing current conditions against previous 6-year average, South Provinces

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MODIS NDVI Difference from 6yr Average: Southwest Provinces



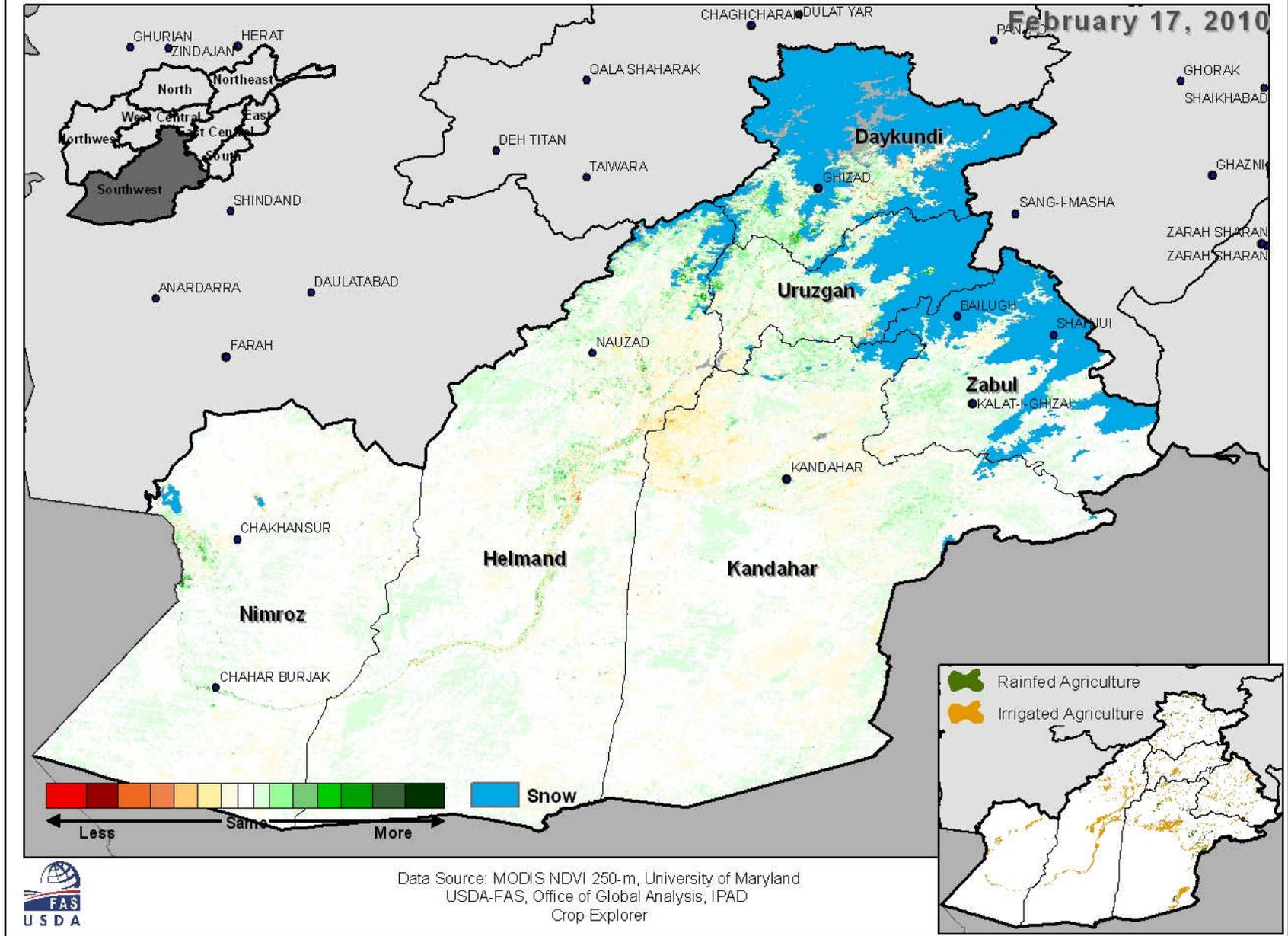
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Figure 23. MODIS NDVI comparing current conditions against previous 6-year average, Southwest Provinces

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MODIS NDVI Difference from Last Year: Southwest Provinces

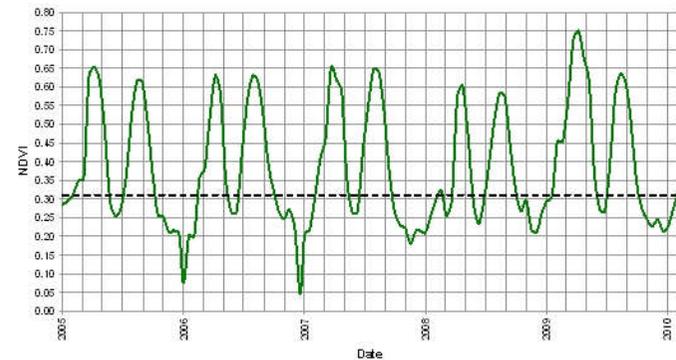
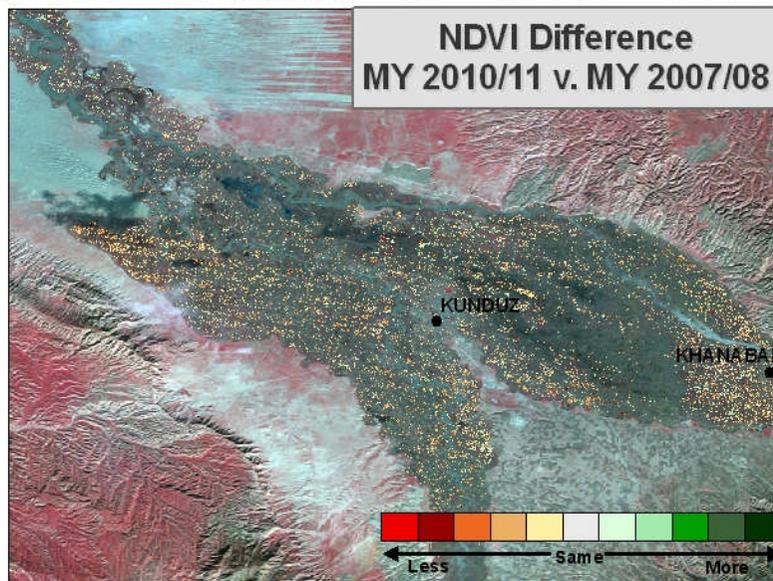
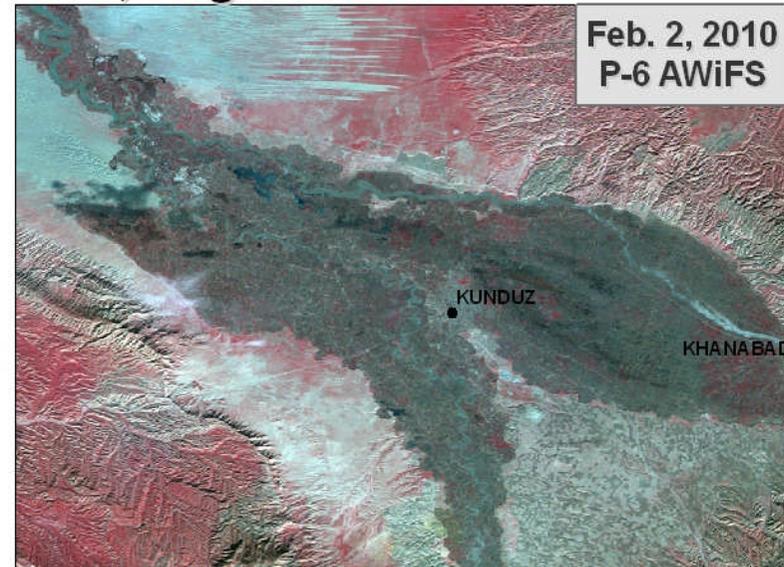


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Figure 24. MODIS NDVI comparing current conditions against previous 6-year average, Southwest Provinces

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Crop Outlook: Kunduz, Afghanistan



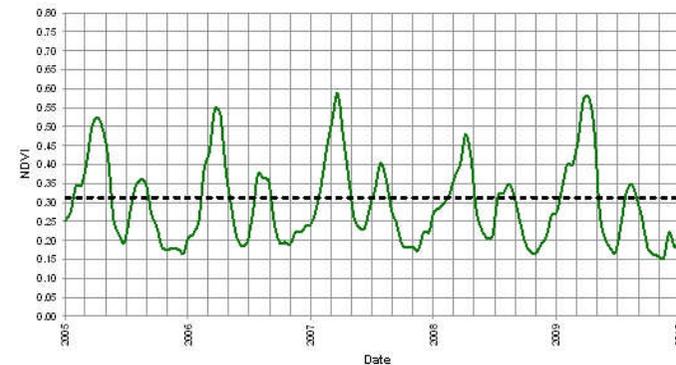
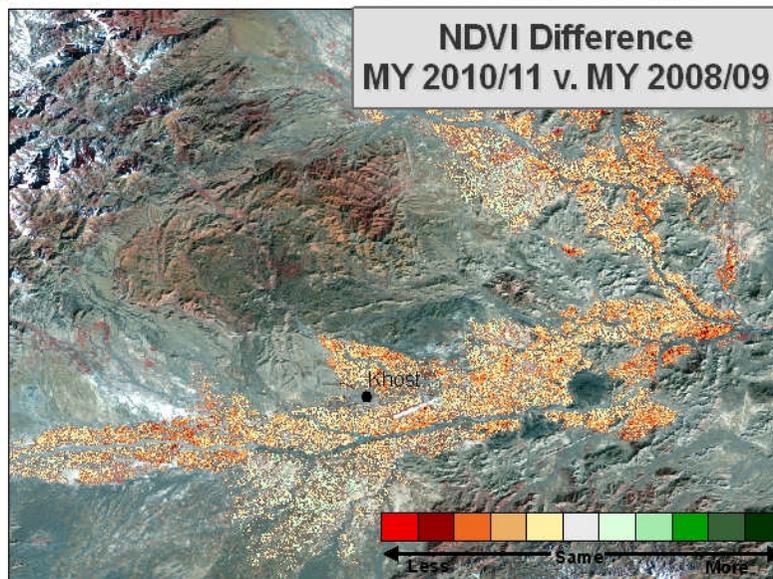
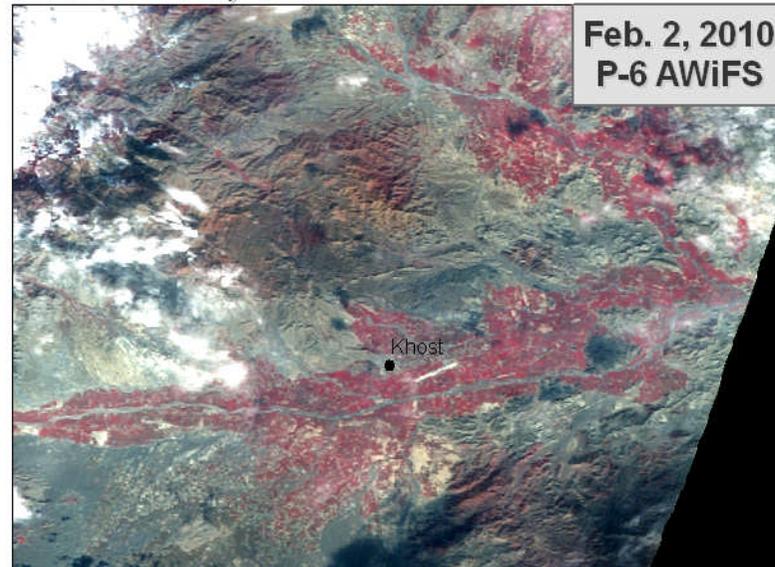
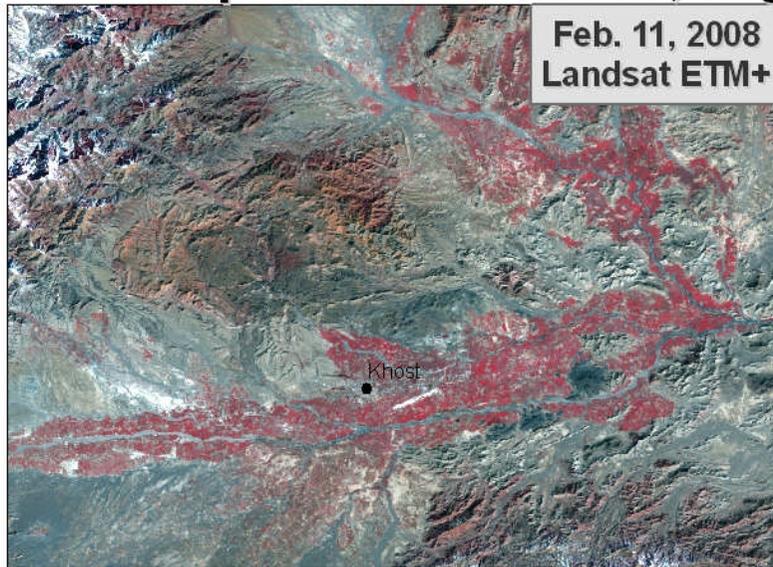
Data Source: P-6 AWiFS; SPOT
Data Provided by: NGA
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Figure 25. Medium resolution satellite imagery highlighting early season agricultural vegetation around Kunduz, Afghanistan. Comparison of MY 2007/08 crop vs. current conditions (MY 2010/11). Major evidence of irrigated crop in this valley should become apparent in coming months.

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Crop Outlook: Khost, Afghanistan, Khost Province



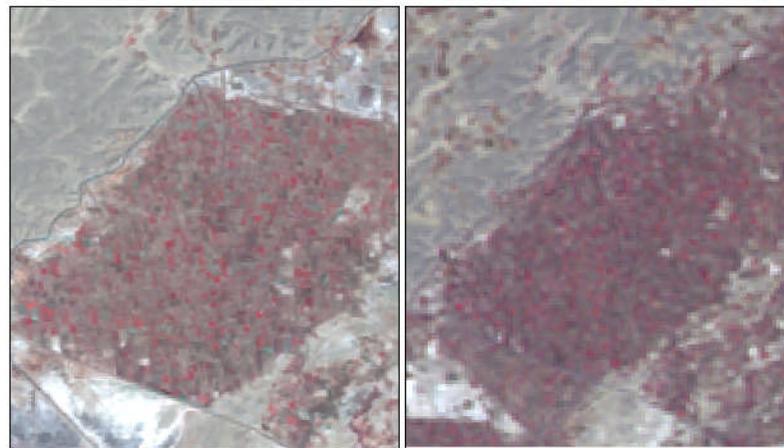
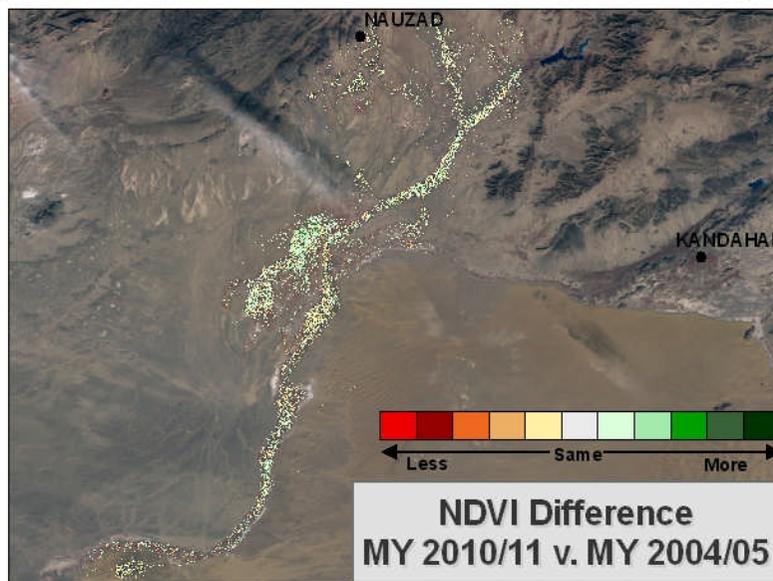
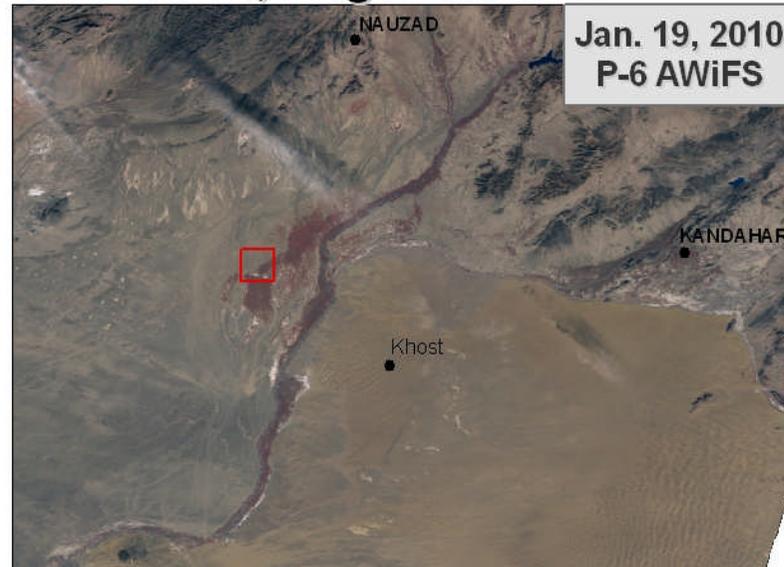
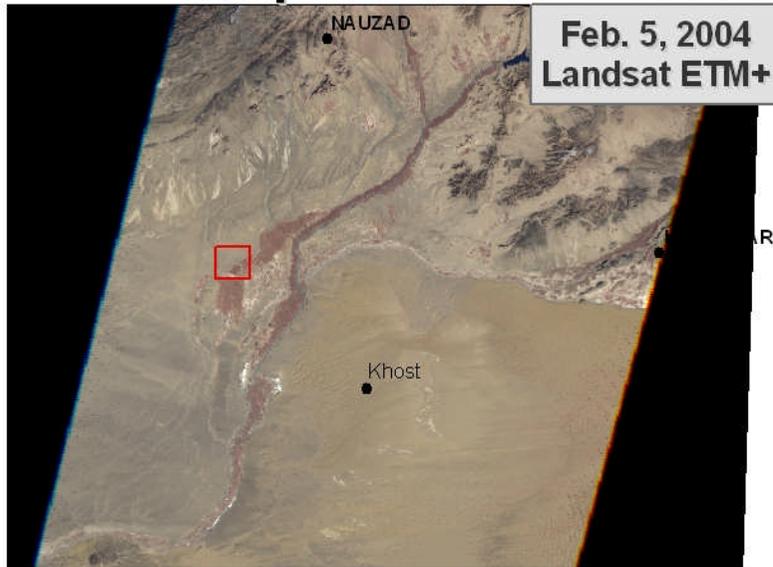
Data Source: P-6 AWiFS; SPOT
Data Provided by: NGA
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Figure 26. Medium resolution satellite imagery highlighting early season agricultural vegetation around Khost, Afghanistan. Comparison of MY 2008/09 crop vs. current conditions (MY 2010/11).

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Crop Outlook: Helmand Province, Afghanistan



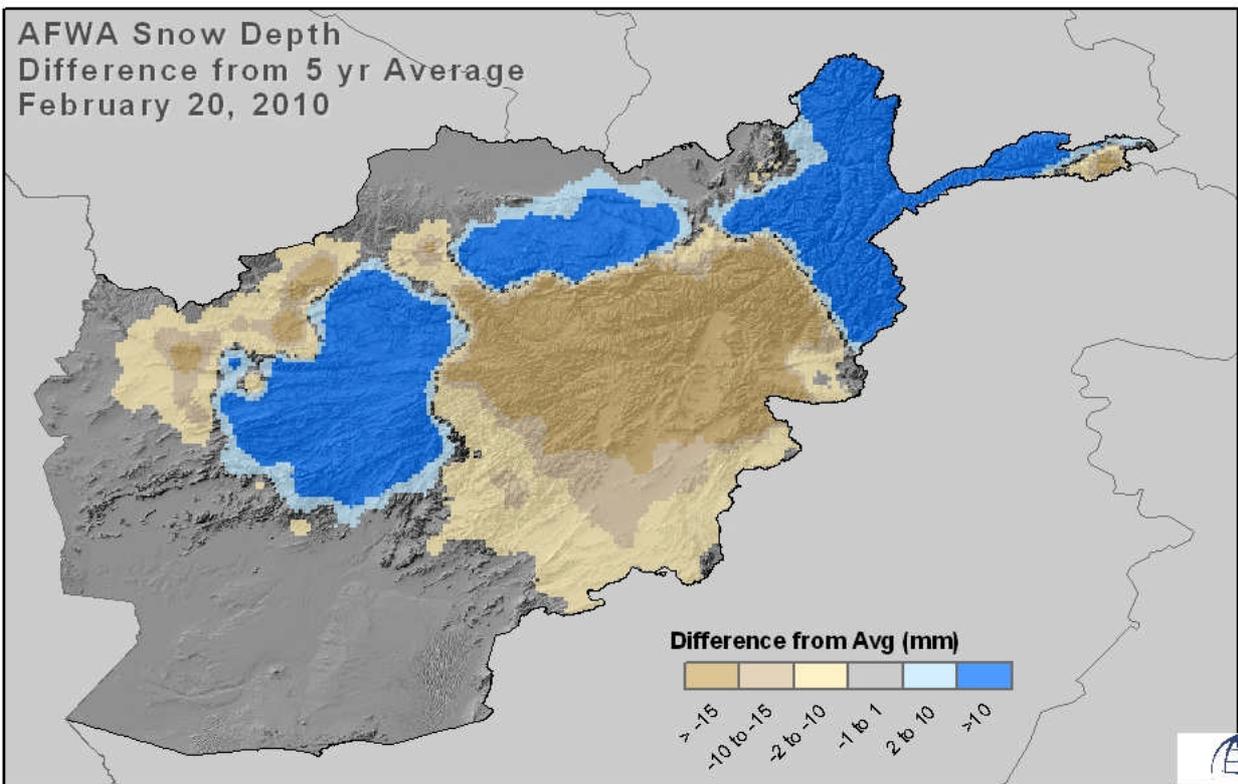
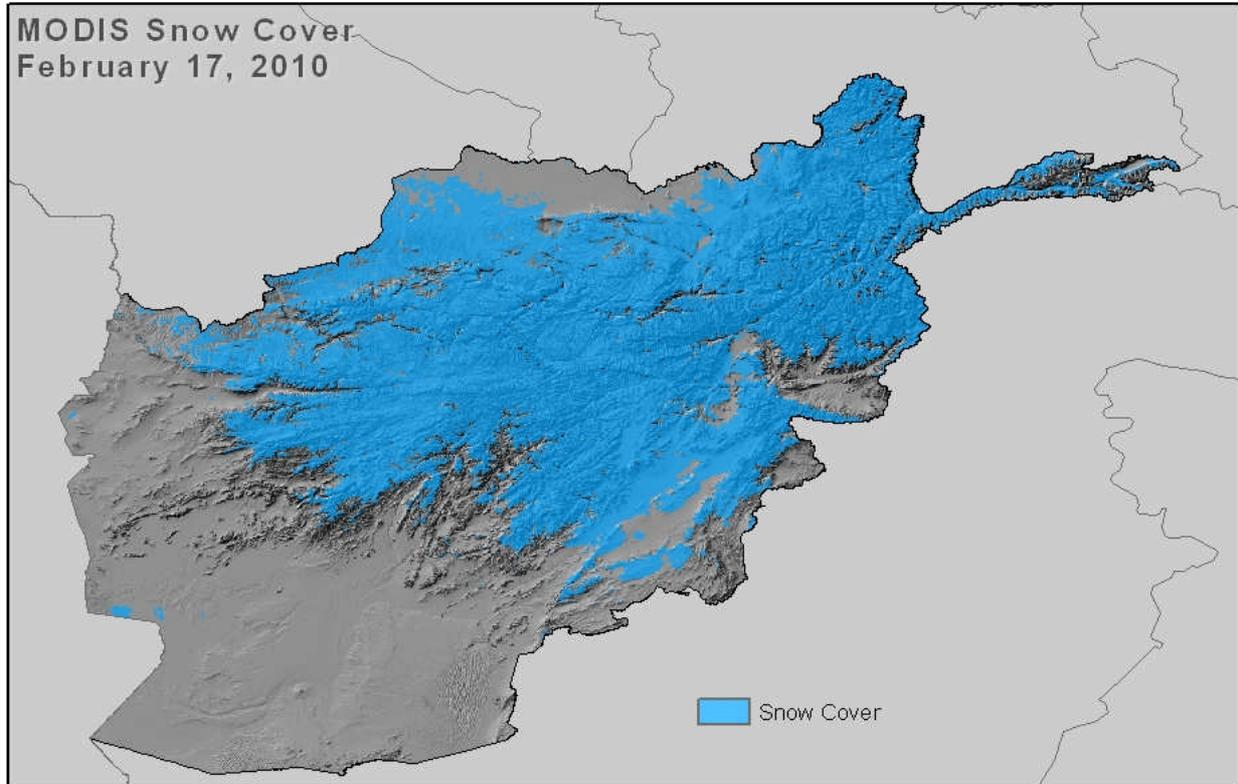
Data Source: P-6 AWiFS; SPOT
Data Provided by: NGA
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Figure 27. Medium resolution satellite imagery highlighting early season agricultural vegetation in Helmand province, Afghanistan. Comparison of MY 2004/05 crop vs. current conditions (MY 2010/11).

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Snow Cover and Depth Difference from Average



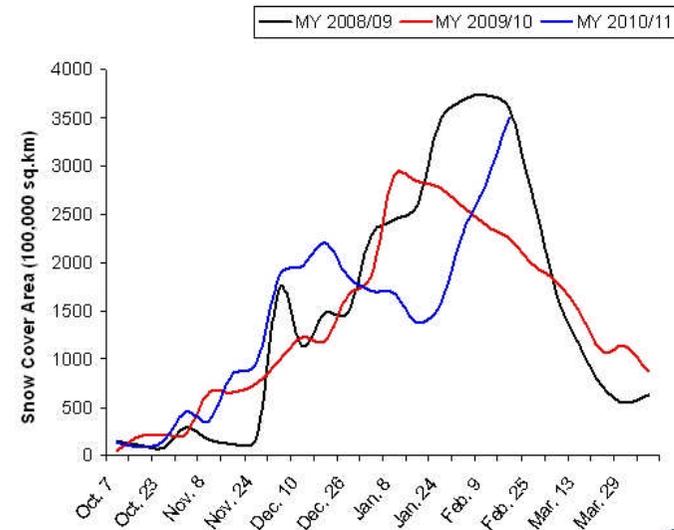
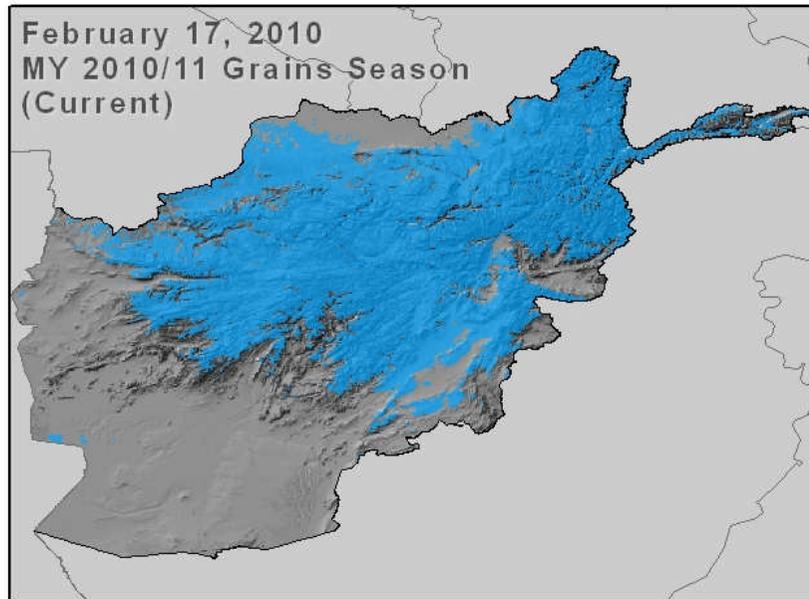
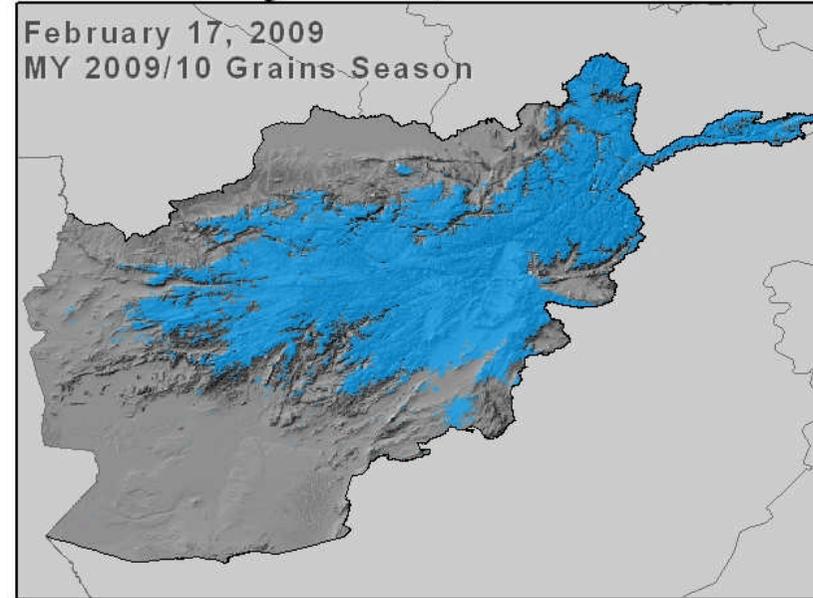
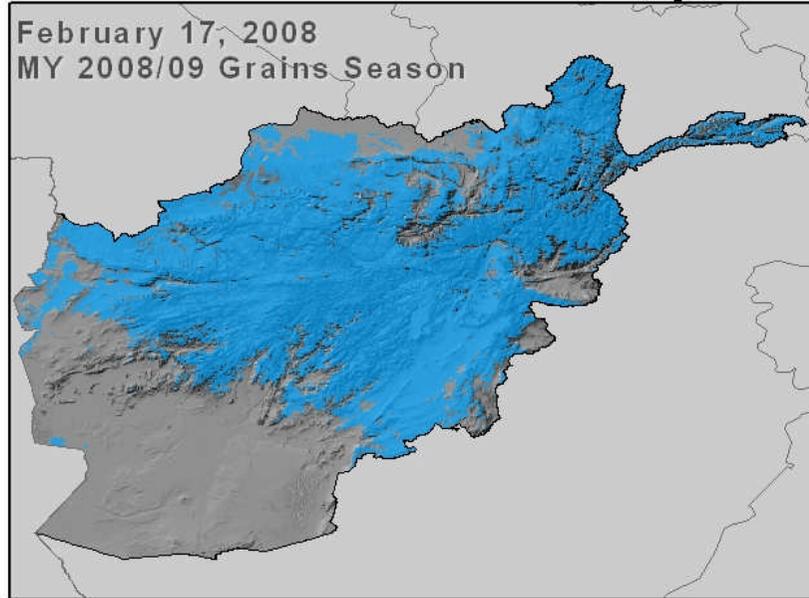
Data Source: MODIS Snow Cover; AFWA Snow Depth
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD

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Figure 28. MODIS snow cover and AFWA snow depth difference from 5 year average.

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MODIS Snow Cover: Comparison February 2008, 2009 and 2010



Data Source: MODIS Snow Cover
 NASA, National Snow and Ice Data Center
 USDA-FAS, Office of Global Analysis, IPAD



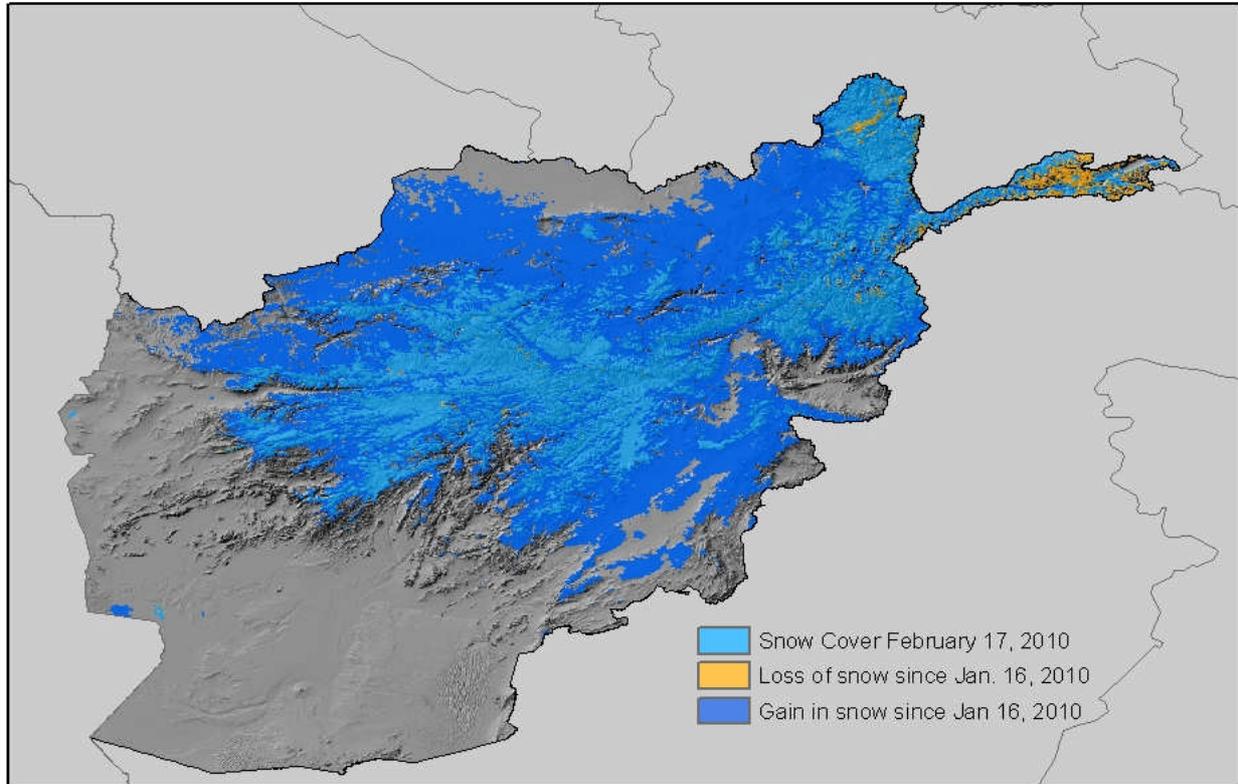
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Figure 29. Comparison of MODIS snow cover area between current season (MY 2010/11), last year (MY 2009/10) and the 2008 crop drought year (MY 2008/09)

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Change in Snow Area: January 2010 to February 2010



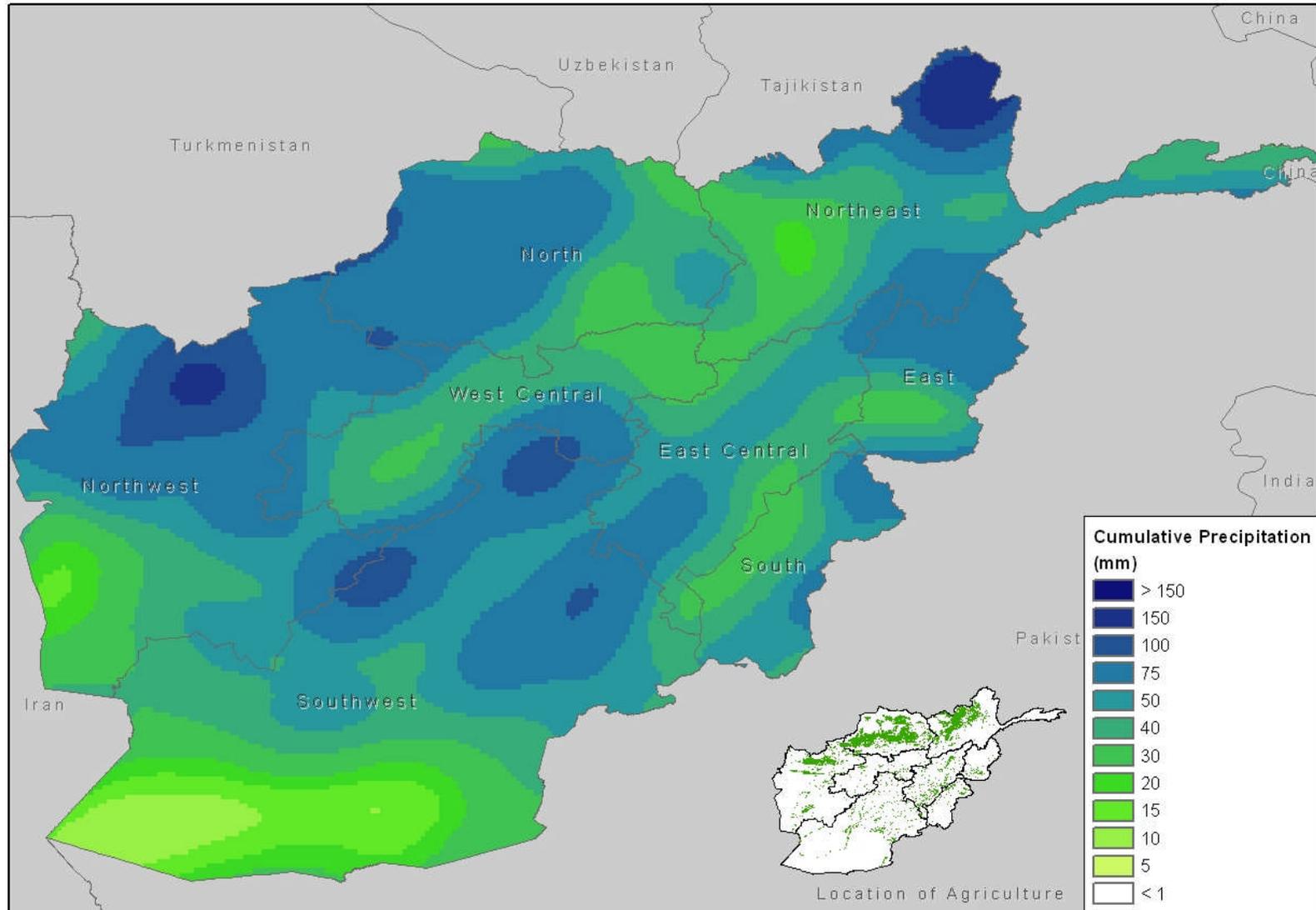
Data Source: MODIS Snow Cover; AFVA Snow Depth
NASA, National Snow and Ice Data Center
USDA-FAS, Office of Global Analysis, IPAD



Figure 30. MODIS snow cover showing gains and losses of winter snow pack over the past month, January 16 to February 17, 2010. Snow area in Afghanistan has increased by 150% since the threateningly low cover reported mid-January.

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7-Day Precipitation Outlook: February 25 - March 4, 2010



Data Source: NOAA Global Forecast System (GFS)
Data Provided by: NOAA CPC
Supporting: USDA/FAS/OGA/IPAD



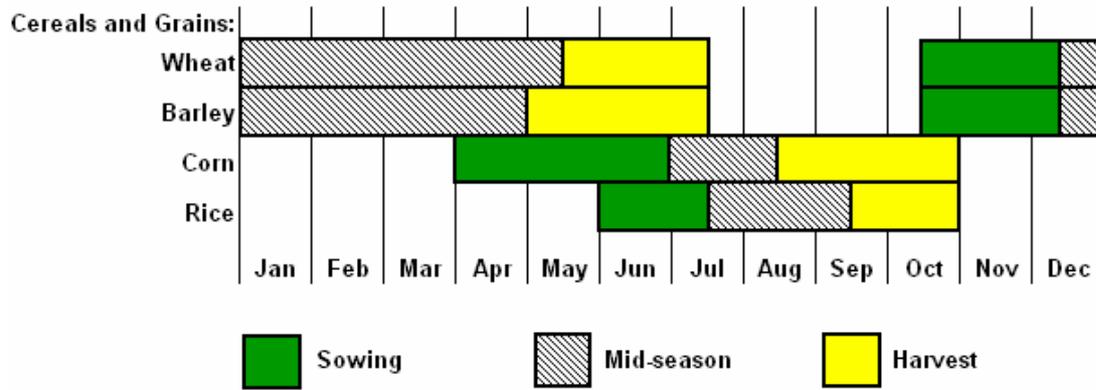
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Figure 31. NOAA Climate Prediction Center 7-day precipitation forecast.

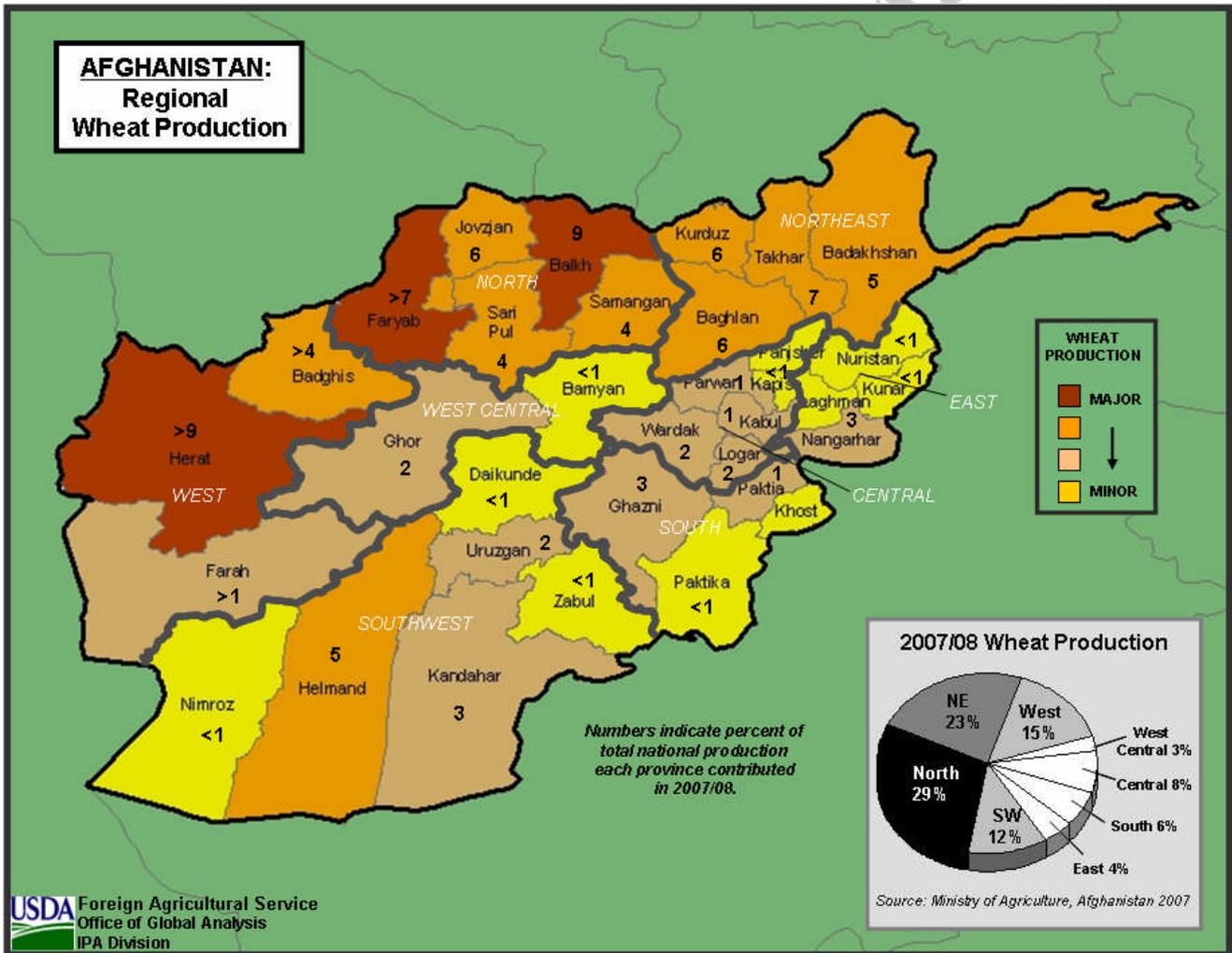
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APPENDIX

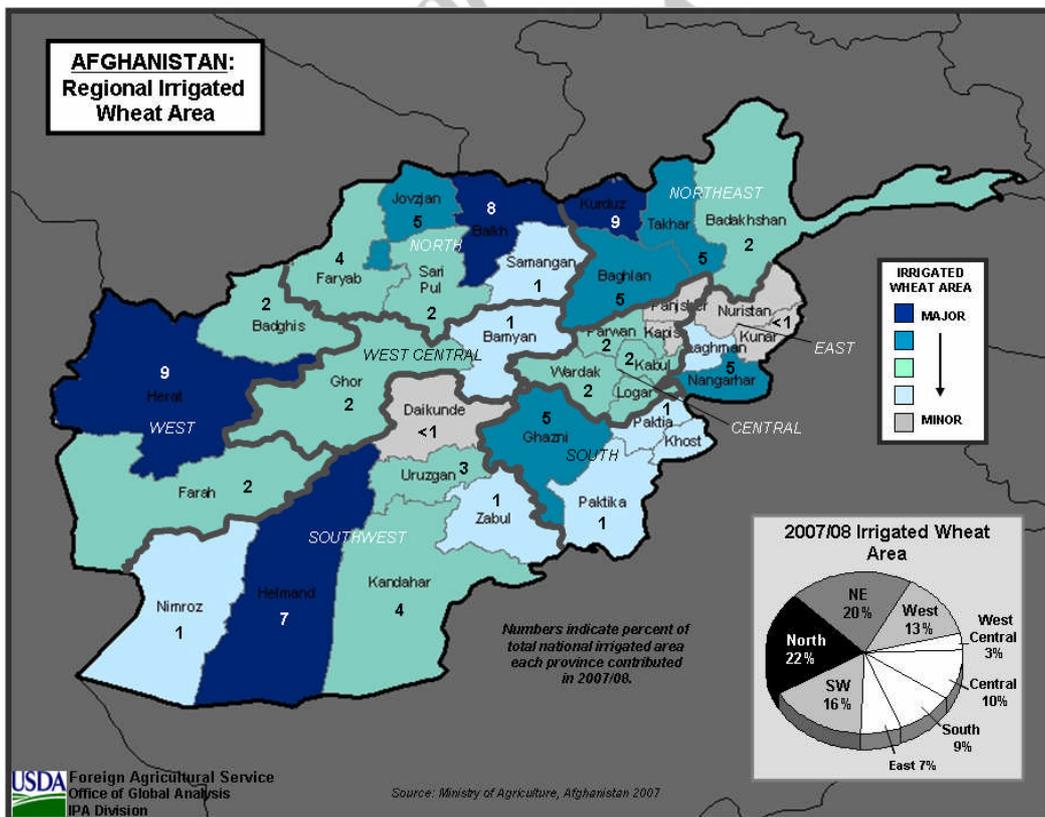
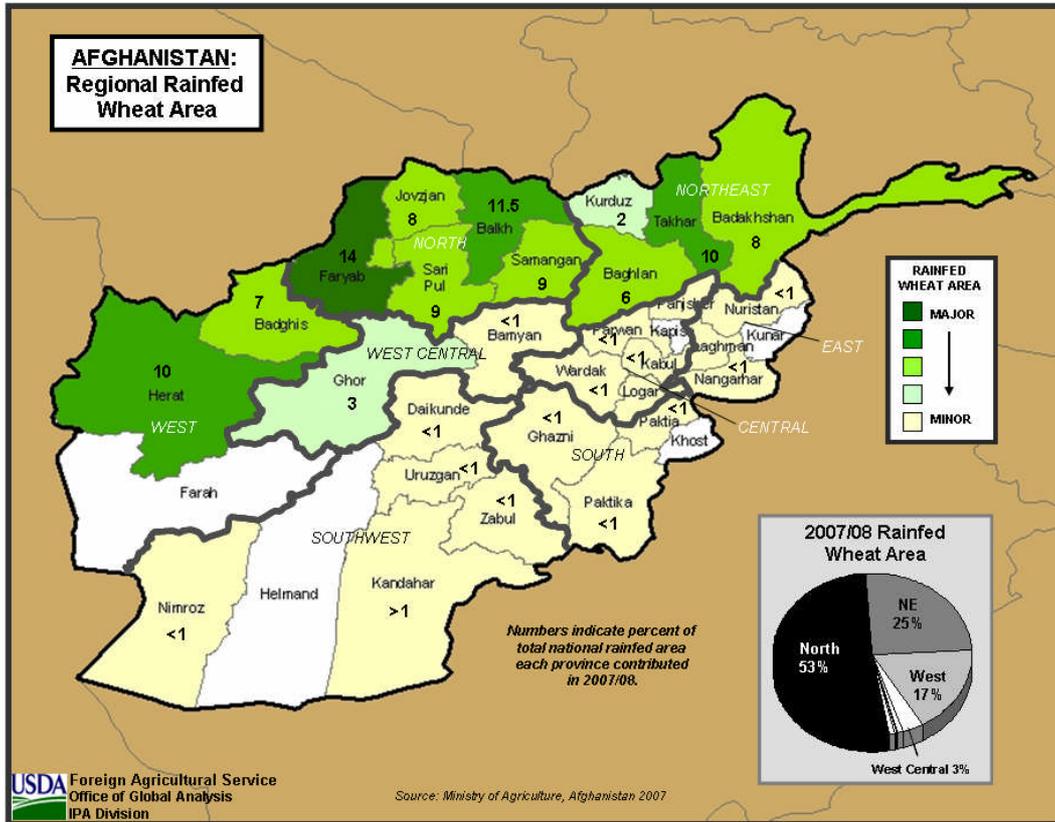
Afghanistan Crop Calendar



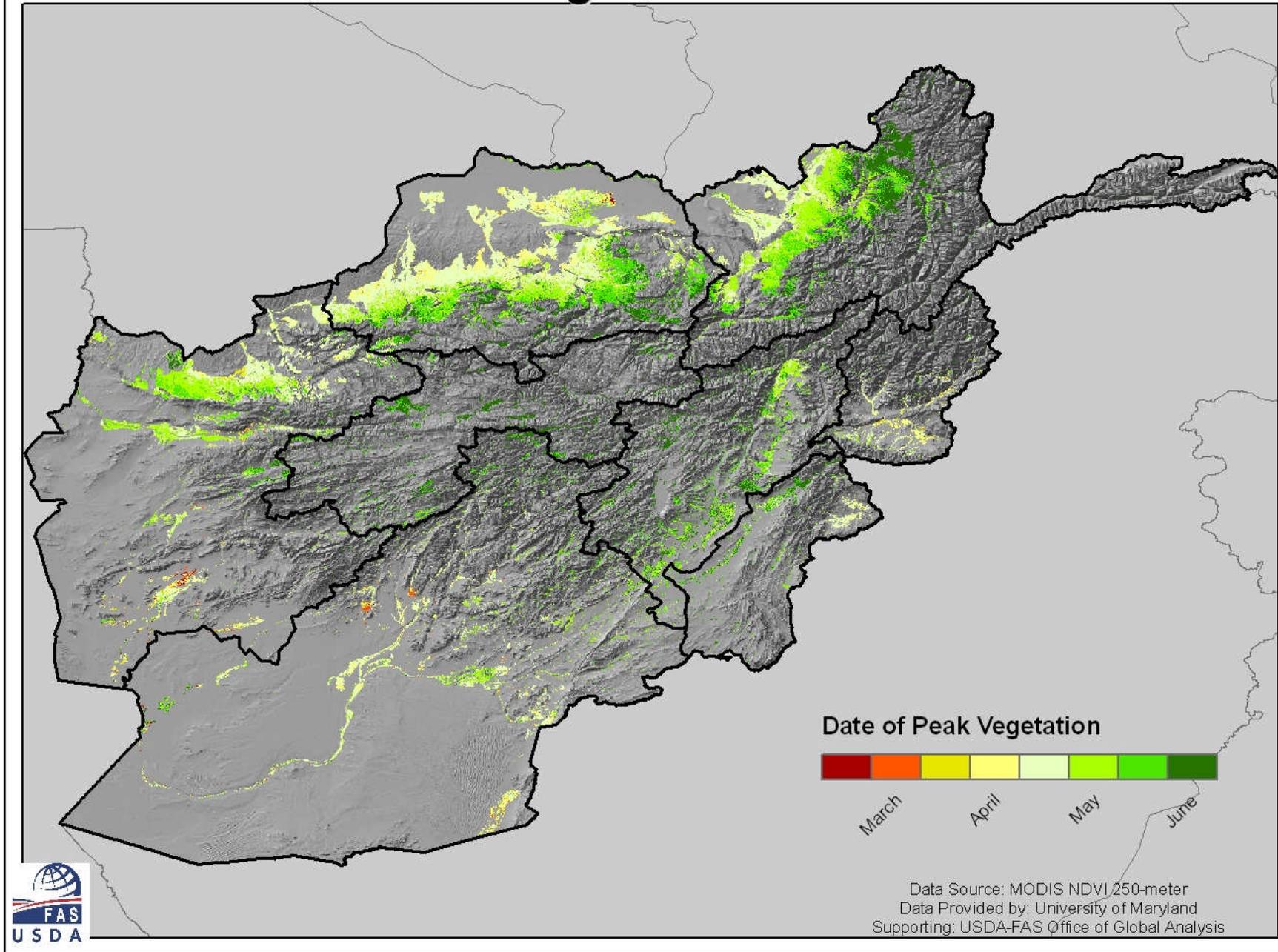
* Calendar represents major production regions. Earlier planting expected in the central highlands.



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Date of Peak Vegetation - Winter Grains



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