United States Department of Agriculture

Foreign Agricultural Service

May 31, 2018

Commodity Intelligence Report

Afghanistan: Low Precipitation Results in a Decline in Northern Winter Grains

Afghanistan's 2018/19 winter grains crop production is expected to be less than the previous year due to below normal precipitation across northern growing areas. Afghanistan typically imports wheat and barley to meet domestic consumption, but when crops are below normal, they have to import more (see the PSD table below).

Commodity	Market Year	Area	Yield	Production	Imports	Consumption
	May to June	*ha x 1000*	*tons/ha*	*- - - - - - - metric tons x 1000 - - - - - - -*		
Wheat	2018/2019	2,500	1.60	4,000	3,500	7,600
	2017/2018	2,550	1.96	5,000	2,600	7,700
	2016/2017	2,550	2.00	5,100	2,700	7,750
	2015/2016	2,550	1.96	5,000	2,700	7,600
	2014/2015	2,560	1.96	5,025	2,000	7,000
	2013/2014	2,550	1.96	5,000	2,050	6,845
	2012/2013	2,512	2.01	5,050	1,600	6,640
	2011/2012	2,100	1.19	2,500	2,200	4,700
	2010/2011	2,300	1.61	3,700	2,000	5,700
	2009/2010	2,575	1.65	4,250	2,500	6,680
	2008/2009	2,140	0.98	2,100	3,800	5,900
Barley	2018/2019	250	1.40	350	25	350
	2017/2018	250	1.60	400	20	450
	2016/2017	219	1.83	400	19	400
	2015/2016	282	1.43	403	9	450
	2014/2015	342	1.52	521	4	500
	2013/2014	278	1.85	514	0	500
	2012/2013	280	1.80	504	0	500
	2011/2012	190	1.61	306	29	330
	2010/2011	212	2.06	437	4	450
	2009/2010	267	1.82	486	16	500
	2008/2009	236	1.41	333	29	360

Data Source: USDA PSD Online

Wheat production for 2018/19 is forecast to be 20 percent below last year at 4.0 million metric tons (mmt). Area is down 2 percent from last year and yield is forecast to decrease by 18 percent. Barley production is forecast at 350,000 metric tons, down 14 percent from last year based mostly on a decline in yield which is forecast at 1.40 tons/hectare (ton/ha). Harvest will begin in May, with the barley

harvest starting first, followed by wheat. Dryland fields show the most negative impacts from the dry weather, whereas irrigated fields appear to be in much better condition.

Afghanistan's winter grains are primarily grown in the Northern provinces with the exception of some area in Helmand province (Fig. 1.) Nearly 70 percent of the crop is irrigated from melting snow from the Hindu Kush Mountains. The remainder of the winter grains, however, are vulnerable to a lack of precipitation. Winter grains did not appear to be affected in Helmand where irrigation is a major factor.

The 2018/19 winter grains growing season started with planting in November 2017 and continued to maturation in April 2018. Total precipitation for the winter grains growing season was not sufficient to produce an adequate dryland crop (Fig. 2). In particular, Faryab and Jowzjen provinces had below normal precipitation and below last year (Fig. 3). Extended dryness occurred during establishment of the crop (when?) and then again during maturation in late March and throughout April. The uptick in rain in March helped, but the total precipitation was below 150 mm and would not be enough to support average yields for this region.

Satellite images (NASA's Terra satellite: 250 m spatial resolution) comparing early May of 2018 to 2017 show less winter vegetation across Faryab and Jowzjen provinces, which represent approximately 20 percent Afghanistan's total wheat production (Fig. 4). A closer inspection using Sentinel-2 satellite imagery (Copernicus: 20 m spatial resolution) shows the differences between this year and a normal year in 2016 (Fig. 5). Digital Globe imagery (World View-3: 1.2 m spatial resolution) clearly shows the diminished presence of winter grains for this year's crop (Fig. 6).

A Normalized Difference Vegetation Index (NDVI) anomaly map depicts a below average crop for the Northern provinces (Fig. 7). Both Jowzjan and Faryab provinces have the lowest recorded NDVI values since 2001 (Fig. 8). Meanwhile in other provinces of Afghanistan (Balkh, Sar-e Pol, Baghlan, and Herat) NDVI values also suggest a below normal crop (Figs. 9 - 11). NDVI values in Helmand and Kunduz provinces, however, indicate an above-normal crop (Figs. 10 and 11). This is most likely due to their reliance on irrigation as the main source of water. Temperatures were above normal for the growing season, but in general were moderate and should not have negatively impacted crop yields (Fig. 12).

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Current area and production estimates for grains and other agricultural commodities are available on:

International Production Assessment Division's (IPAD) Agricultural Production page
Crop Explorer https://ipad.fas.usda.gov/cropexplorer/
or
USDA Production, Supply and Distribution Database (PSD Online)
http://apps.fas.usda.gov/psdonline/psdHome.aspx

U. S. Department of Agriculture
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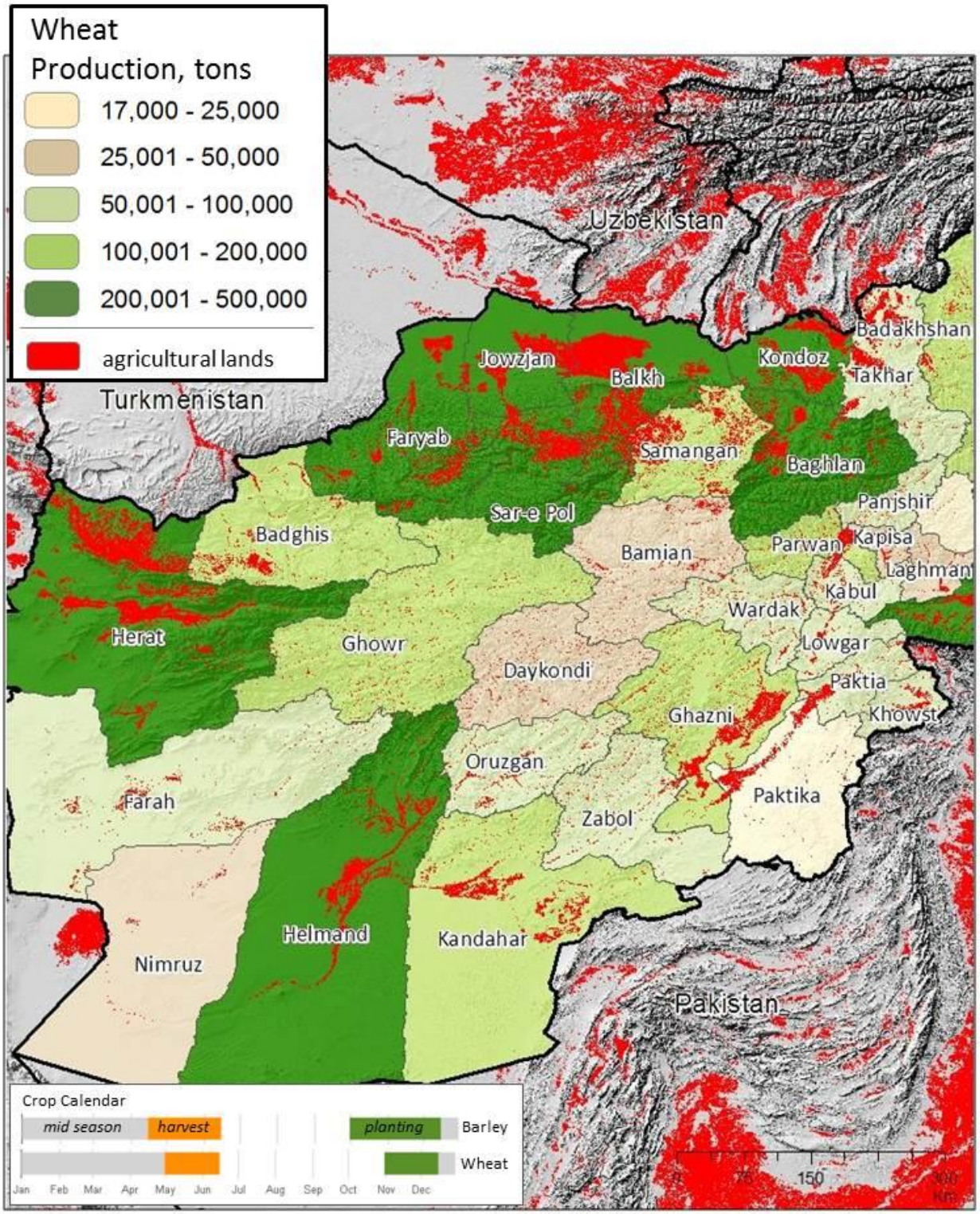
Figure 1. Afghanistan wheat production by province.

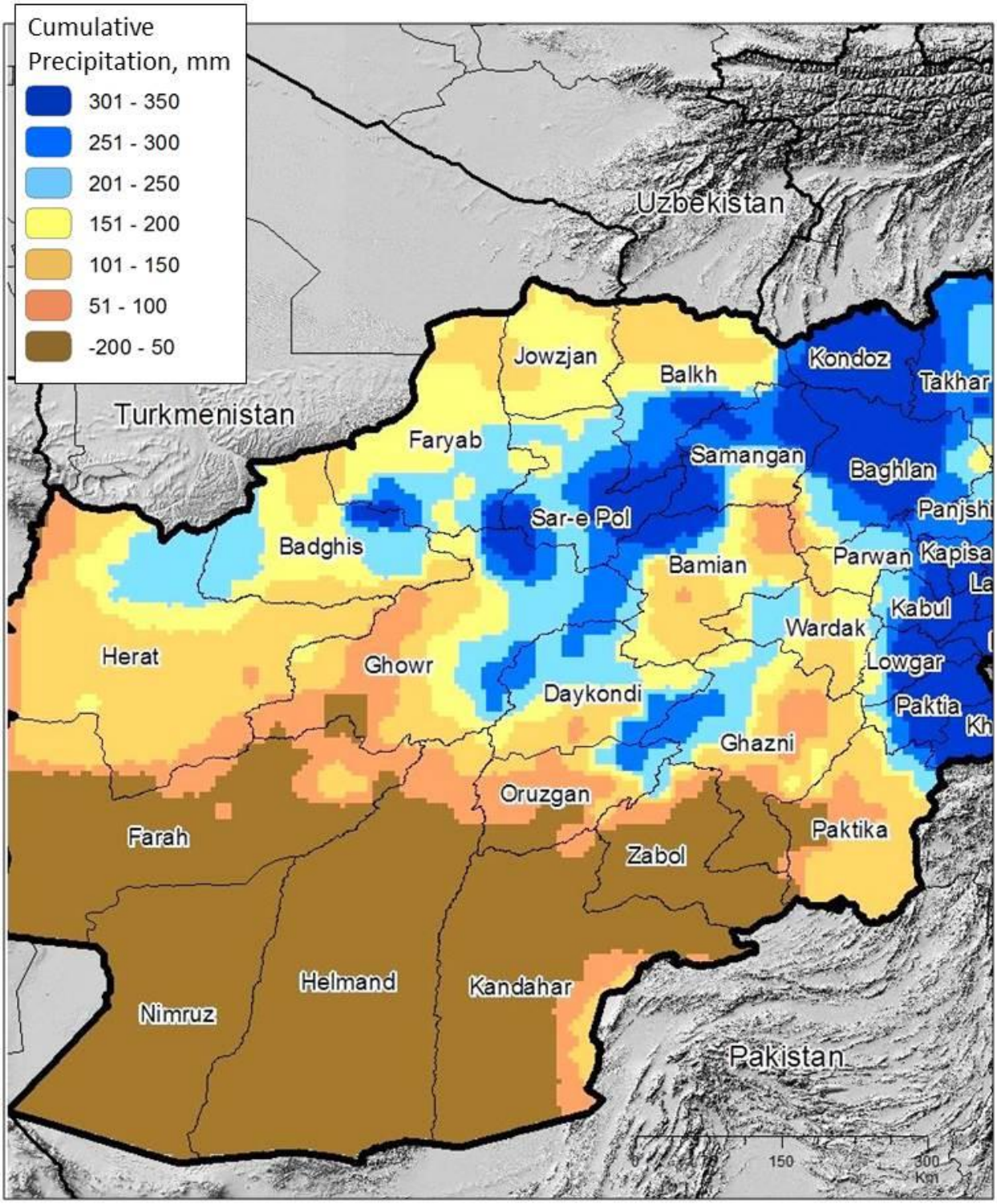


DATA SOURCE

2010 VISNAV land use and land cover
USDA FAS Provincial Wheat Production Estimates
NASA Shuttle Radar Topography Mission 90m derived Digital Elevation Model

USDA
FAS OGA IPAD

Figure 2. Cumulative precipitation map for Afghanistan from 01 NOV 2017 to 30 APR 2018.

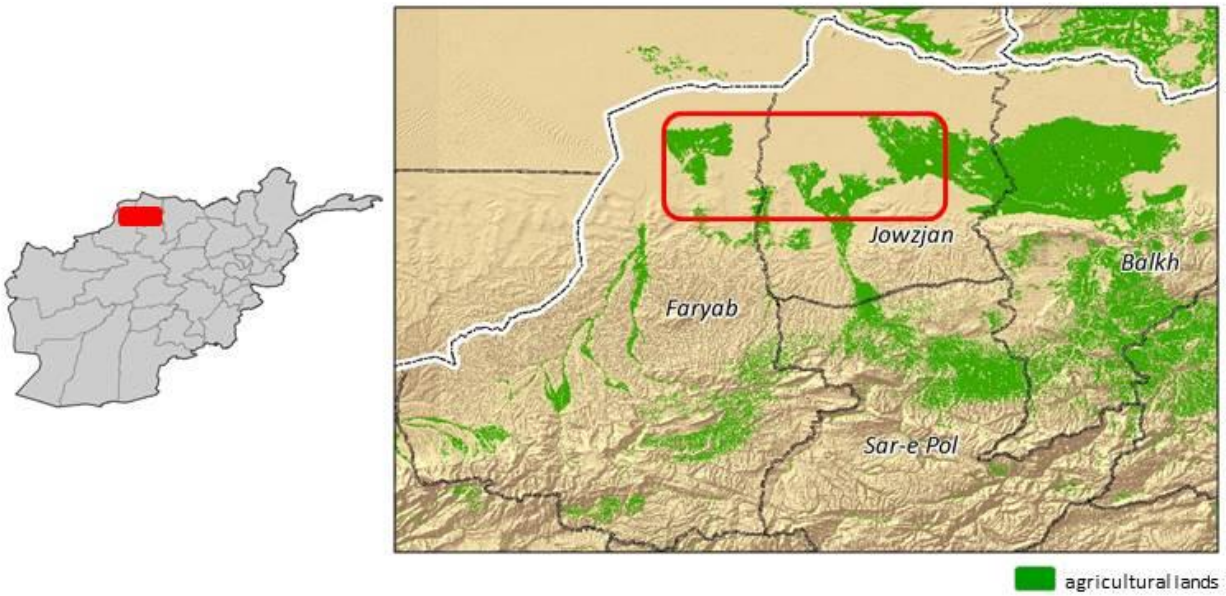


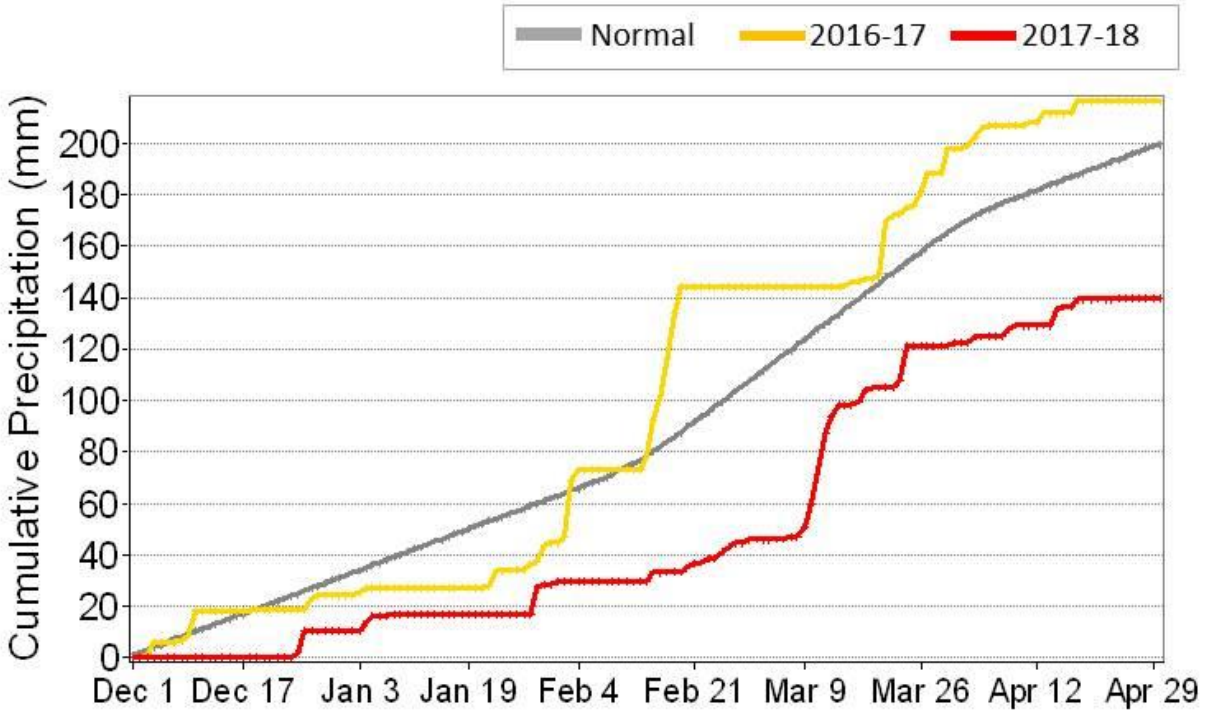
DATA SOURCE

US Air Force 557th Weather Wing - LIS grid
NASA Shuttle Radar Topography Mission 90m derived Digital Elevation Model

USDA
FAS OGA IPAD

Figure 3. Cumulative precipitation for selected area in Jowzjan and Faryab provinces.



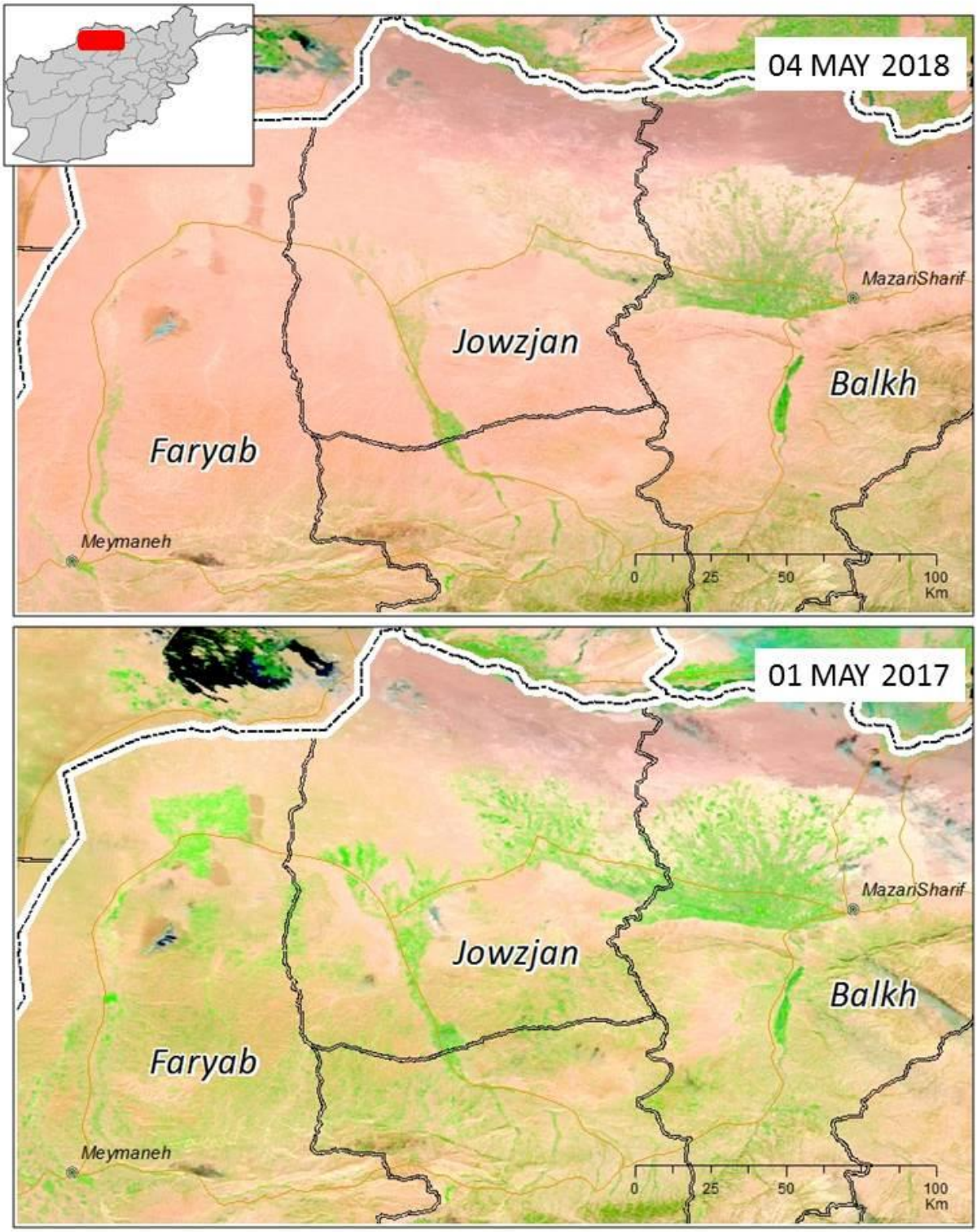


DATA SOURCE

2010 VISNAV land use and land cover
US Air Force 557th Weather Wing - LIS grid

USDA
FAS OGA IPAD

Figure 4. Satellite image comparing vegetation in May 2018 to May 2017.



DATA SOURCE

MODIS Terra EOS AM false color (721) satellite image
NASA LANCE / USDA GEOGLAM

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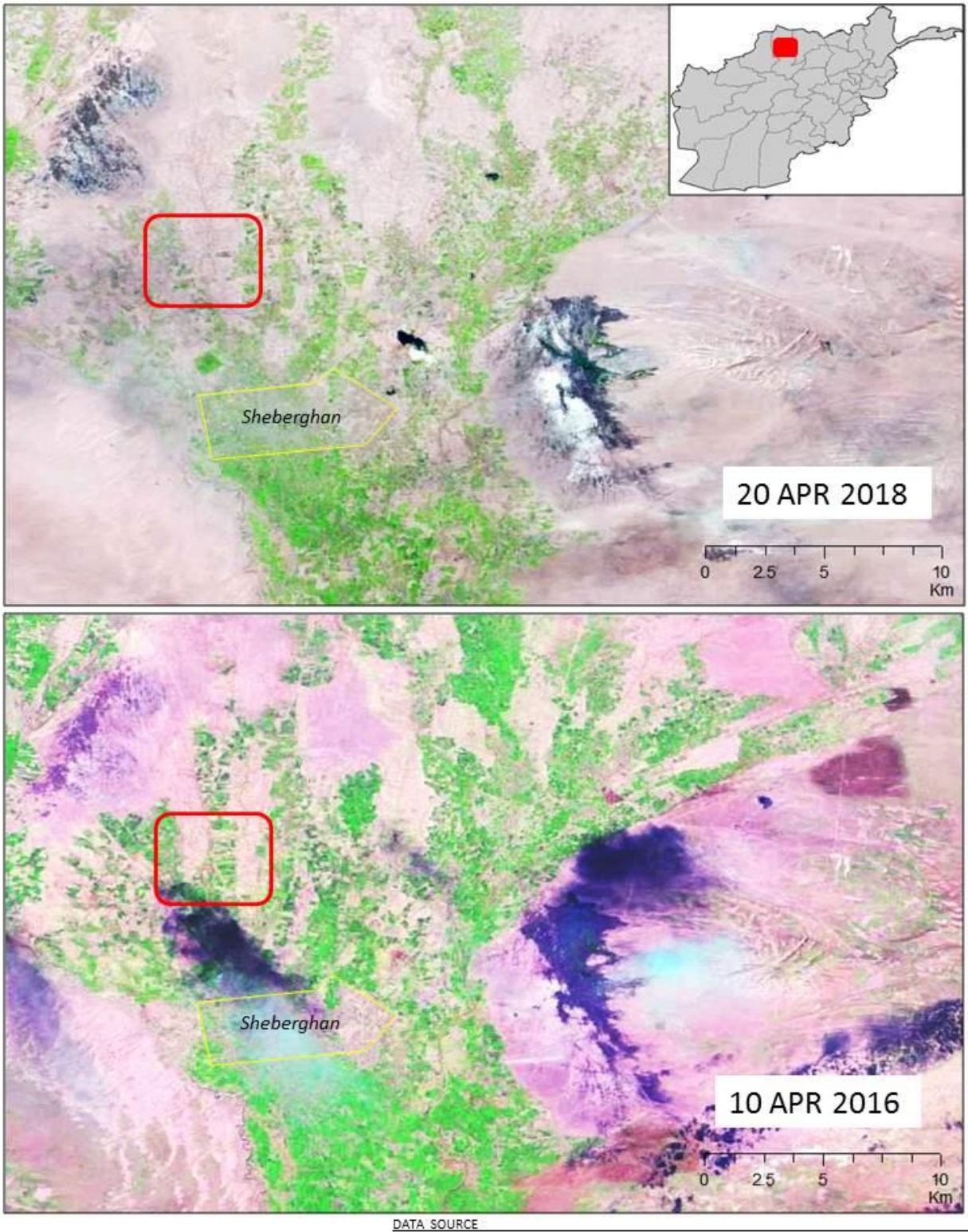
Figure 5. Satellite image comparing vegetation in April 2018 to April 2016.



DATA SOURCE

USDA
FAS OGA IPAD

Sentinel-2a true color satellite image
ESA Copernicus Program / USGS Earth Explorer

Figure 6. High resolution satellite image comparing fields in April 2018 to April 2017.

DATA SOURCE

Digital Globe GEOI satellite image | Enhanced View Web Hosting Service
Digital Globe Worldview-3 satellite image | Enhanced View Web Hosting Service

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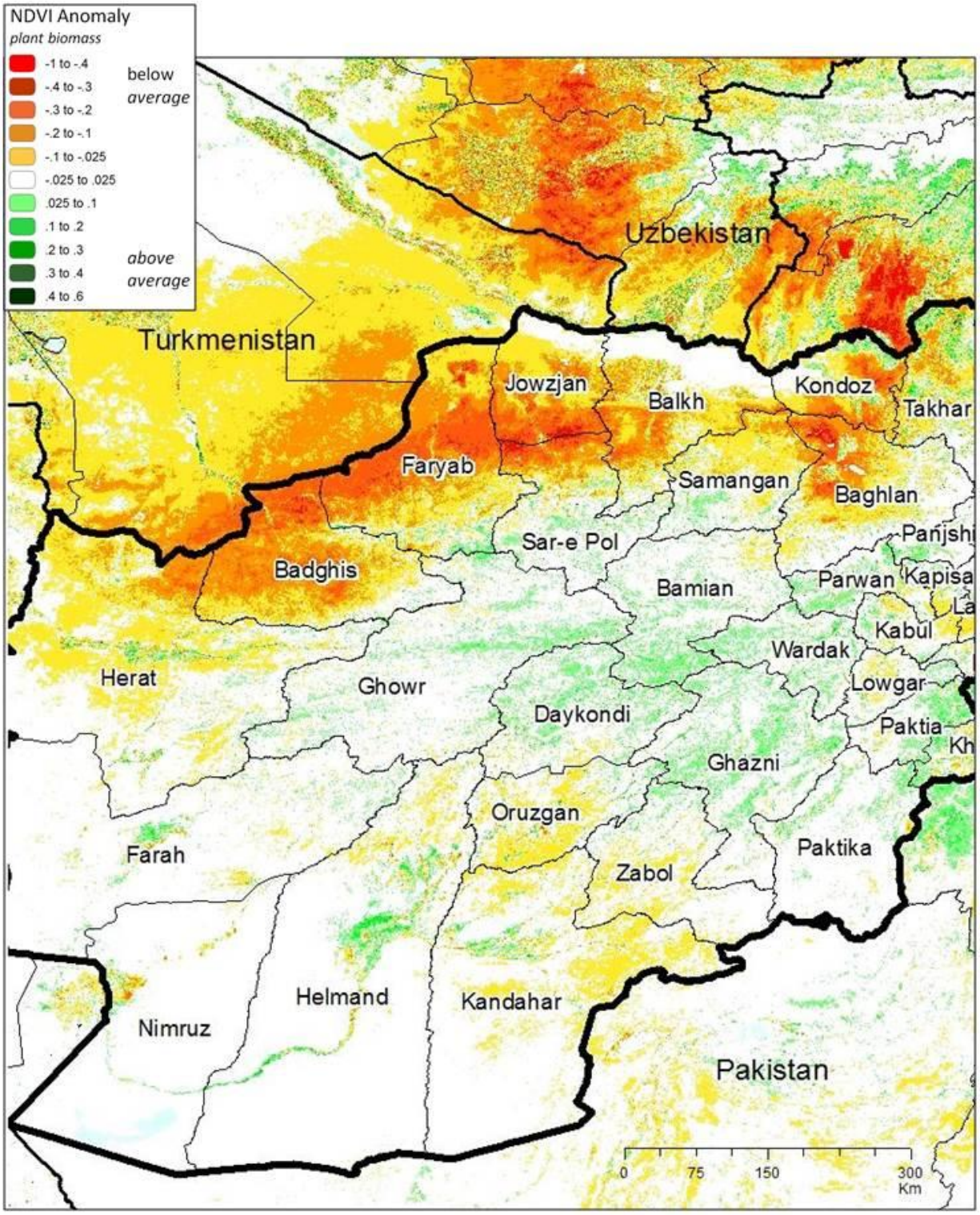
Figure 7. Vegetation index anomaly map for Afghanistan.



DATA SOURCE

Terra EOS AM MODIS 8-day composite | NASA GSFC GIMMS / USDA GEOGLAM

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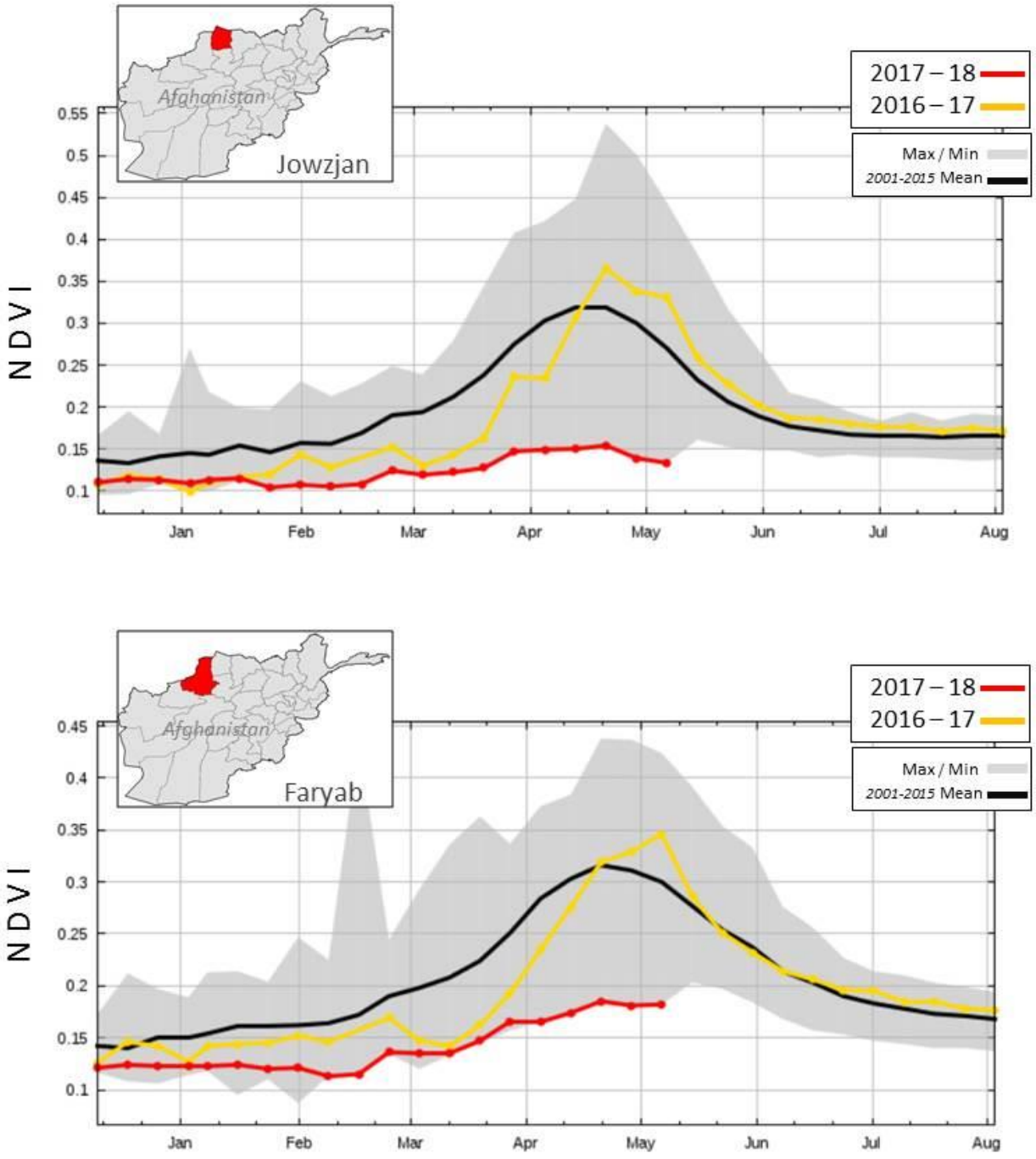
Figure 8. Winter grains vegetation indices for Jowzjan and Faryab provinces.



DATA SOURCE

Aqua EOS PM MODIS 8-day composite with 2010 VISNAV-LULC mask applied
NASA GSFC GIMMS / USDA GEOGLAM

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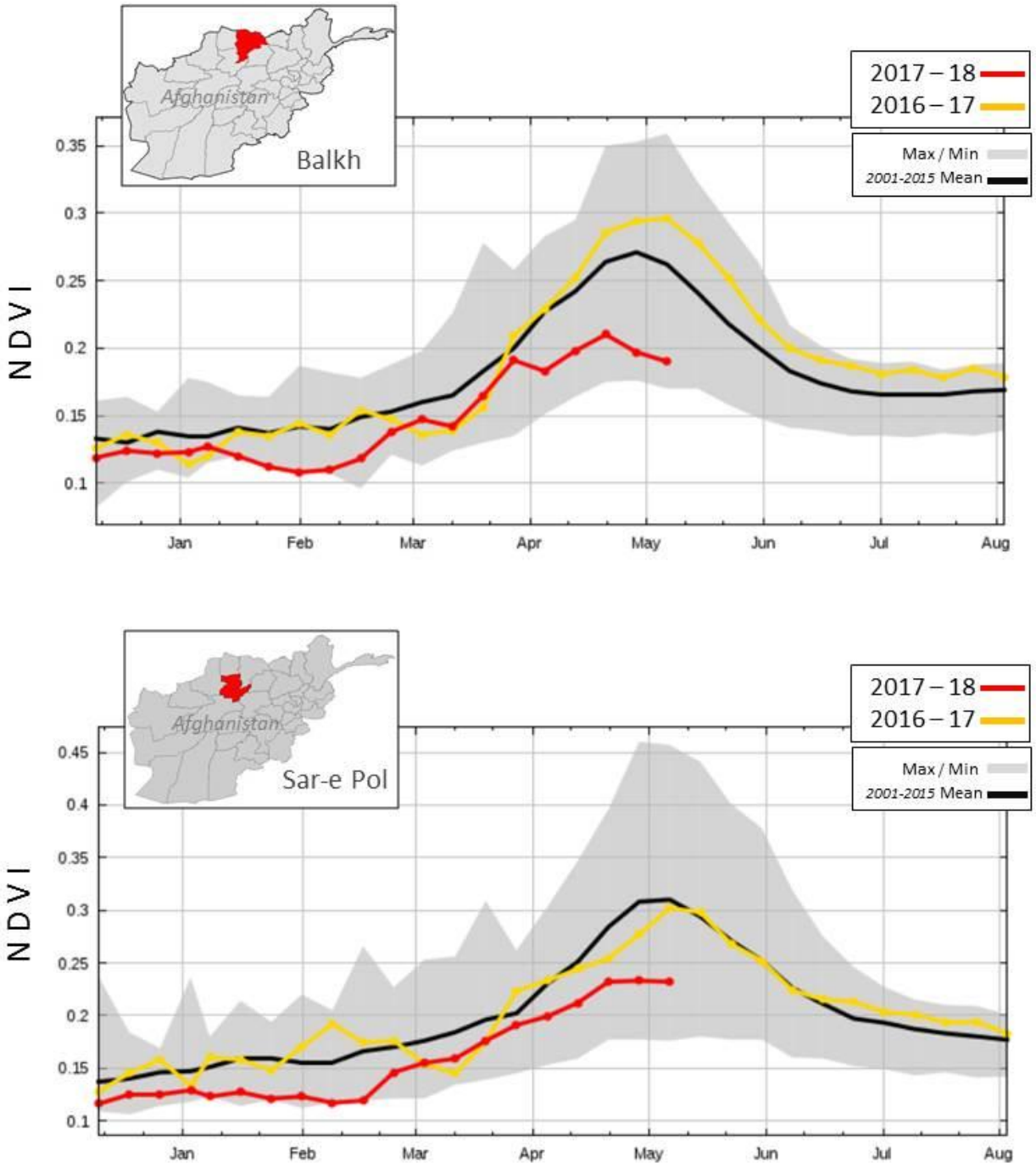
Figure 9. Winter grains vegetation indices for Balkh and Sar-e Pol provinces.



DATA SOURCE

Aqua EOS PM MODIS 8-day composite with 2010 VISNAV-LULC mask applied
NASA GSFC GIMMS / USDA GEOGLAM

USDA
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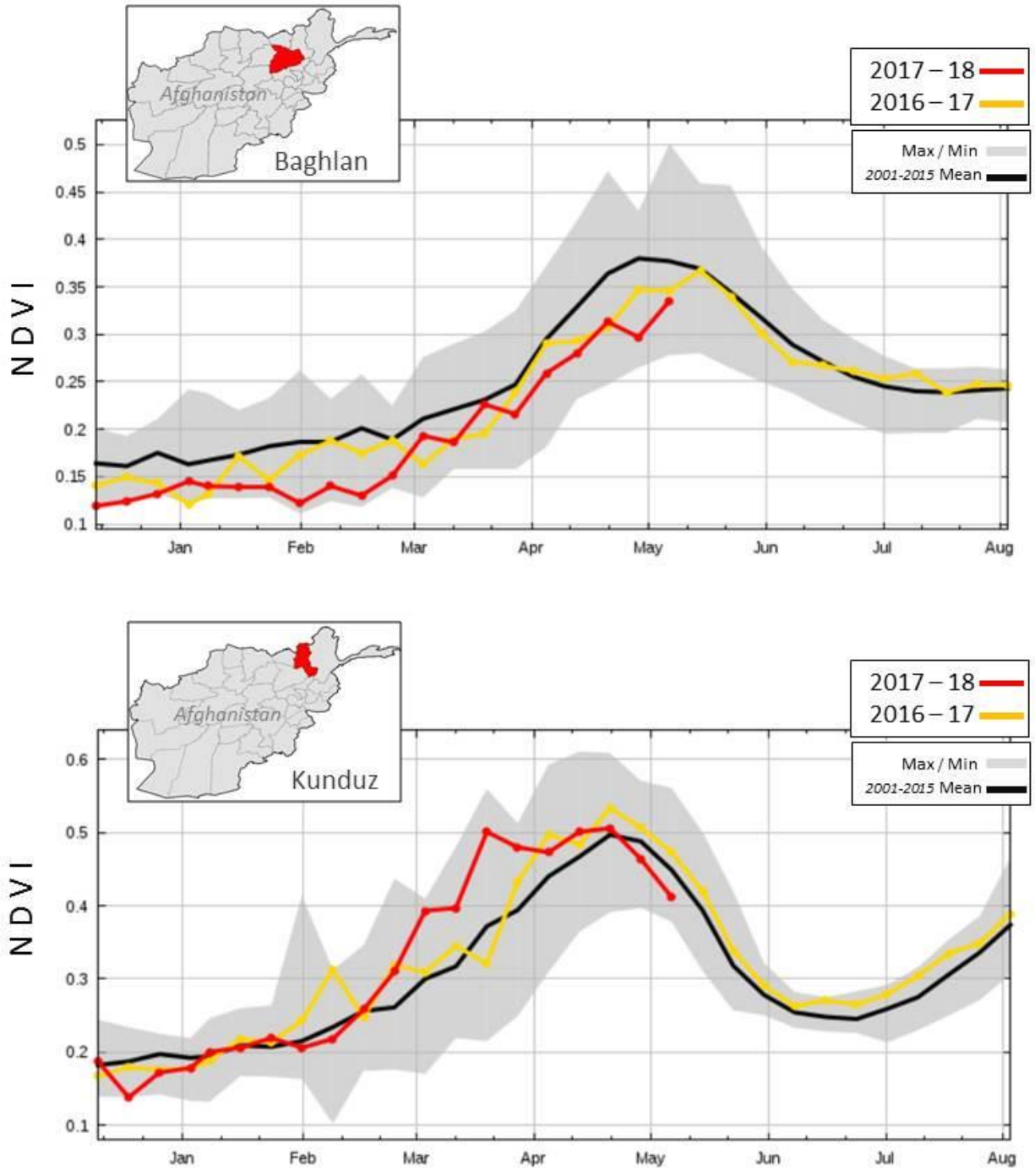
Figure 10. Winter grains vegetation indices for Baghlan and Kunduz provinces.

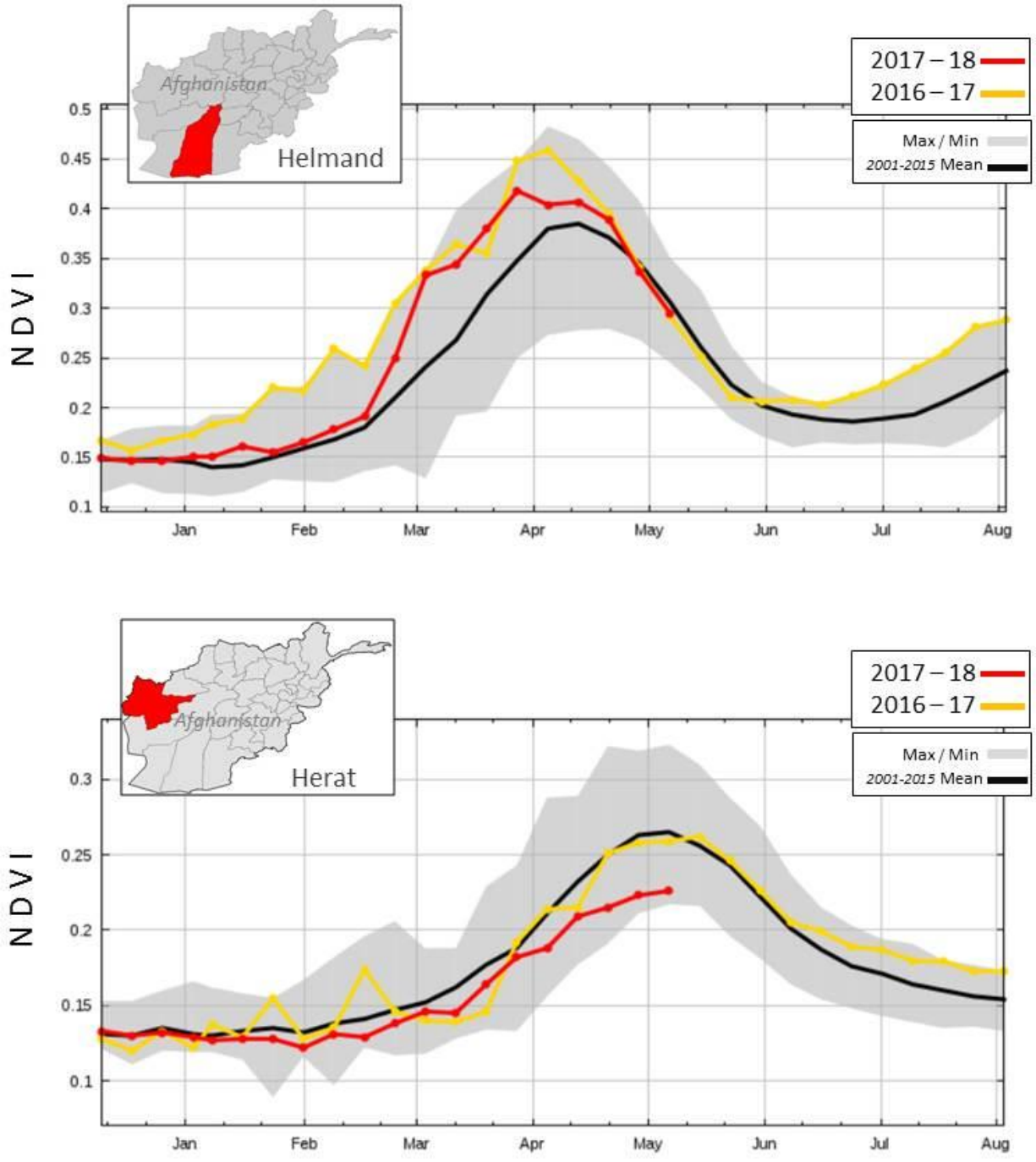


DATA SOURCE

Aqua EOS PM MODIS 8-day composite with 2010 VISNAV-LULC mask applied
NASA GSFC GIMMS / USDA GEOGLAM

USDA
FAS OGA IPAD

Figure 11. Winter grains vegetation indices for Helmand and Herat provinces.



DATA SOURCE

Aqua EOS PM MODIS 8-day composite with 2010 VISNAV-LULC mask applied
NASA GSFC GIMMS / USDA GEOGLAM

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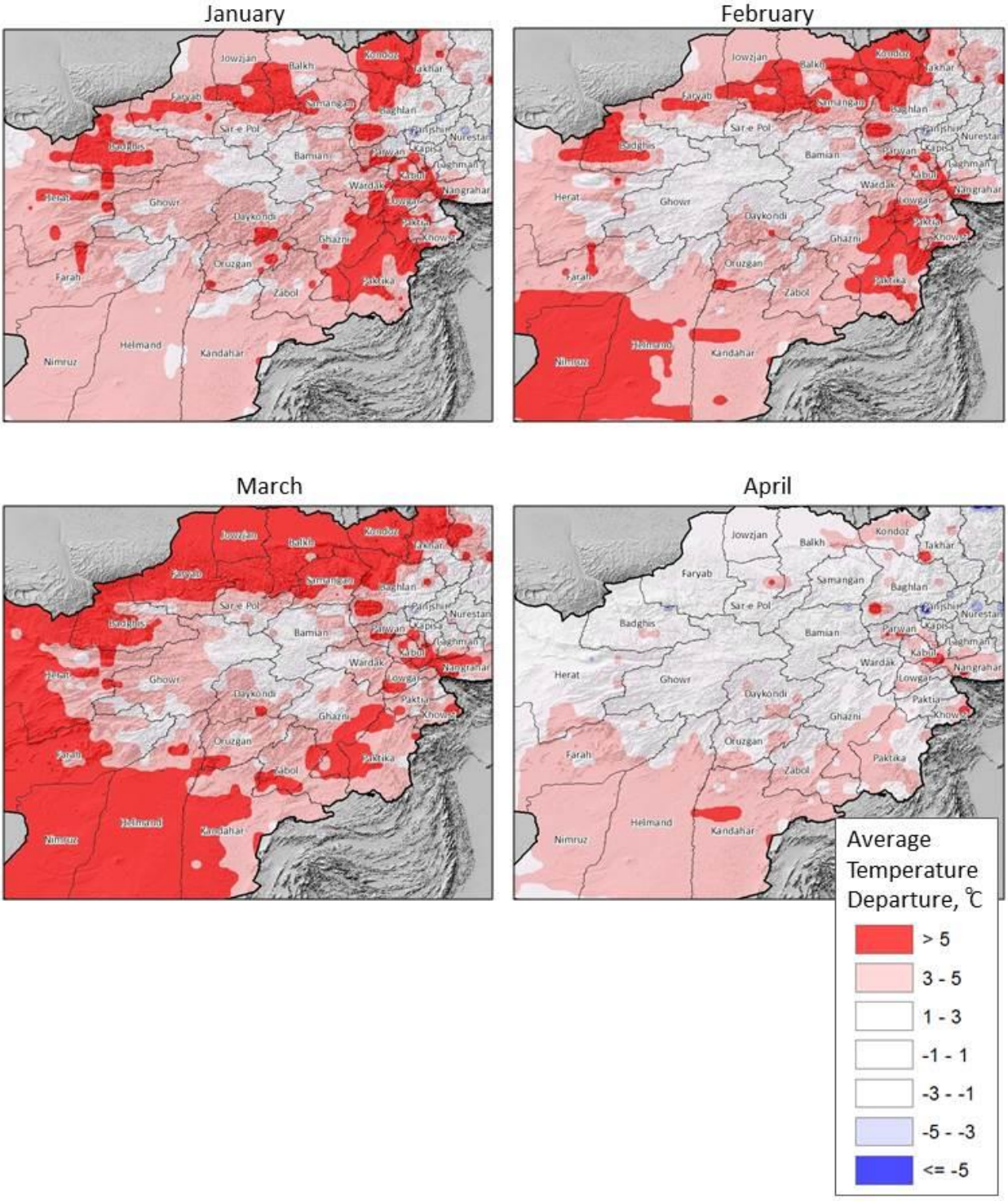
Figure 12. Average temperature departure.



DATA SOURCE

US Air Force 557th Weather Wing - LIS grid
NASA Shuttle Radar Topography Mission 90m derived Digital Elevation Model

USDA
FAS OGA IPAD