

Displacement & Destruction: Analysis of Idlib, Syria 2017–2020

4 March 2020



Areas of Interest

The [Signal Program on Human Security and Technology](#) at the [Harvard Humanitarian Initiative](#) used very high-resolution satellite imagery collected between 2017 and 26 February 2020 from Maxar Technologies, also known as DigitalGlobe, to analyze the expansion of internally displaced person (IDP) camps and the destruction of towns in Idlib Governorate in North-West Syria.

As the Syrian war enters its tenth year, the following satellite imagery analysis illustrates how parts of the Syrian landscape have dramatically changed through bombardment, conflict, and civilian displacement. This analysis provides a limited view of the realities on the ground; at this stage, it primarily focuses on what can be determined via imagery. The analyzed sites represent a portion of the camps and towns and do not show the full extent of all areas; the figures generated from this analysis only correspond to the sites shown. Sites were selected for public-facing analysis based on several factors, including: the availability and quality of imagery; the visibility of camp expansion; and corroborating reports of fighting in the region. Sections of larger towns were excluded from this report based on preliminary analysis that identified concerns for civilian protection. The exact locations of the regions analyzed are intentionally withheld from this report.

What Can (and Can't) Be Seen

It is important to note that those most exposed to the elements, without any form of tarping or shelter, cannot be clearly perceived via the commercial-grade imagery available to humanitarians and NGOs.

OCHA and aid organizations estimate that 60 percent of IDPs are children, and that tens of thousands are exposed and without shelter.



Key Findings

- Analysts found that the size of the two analyzed IDP camp sites increased approximately 100% and 177% between 27 September 2017 and 26 February 2020 – nearly doubling and tripling in size.
- In February 2020, there are indicators of planned structure expansion in both IDP camps, as noted by the construction of building foundations. There are large additions of small informal structures along the edges of the analyzed camps.
- Damage assessments conducted in two towns devastated by fighting in southern Idlib suggested that approximately 30% of the structures were entirely or partially destroyed.

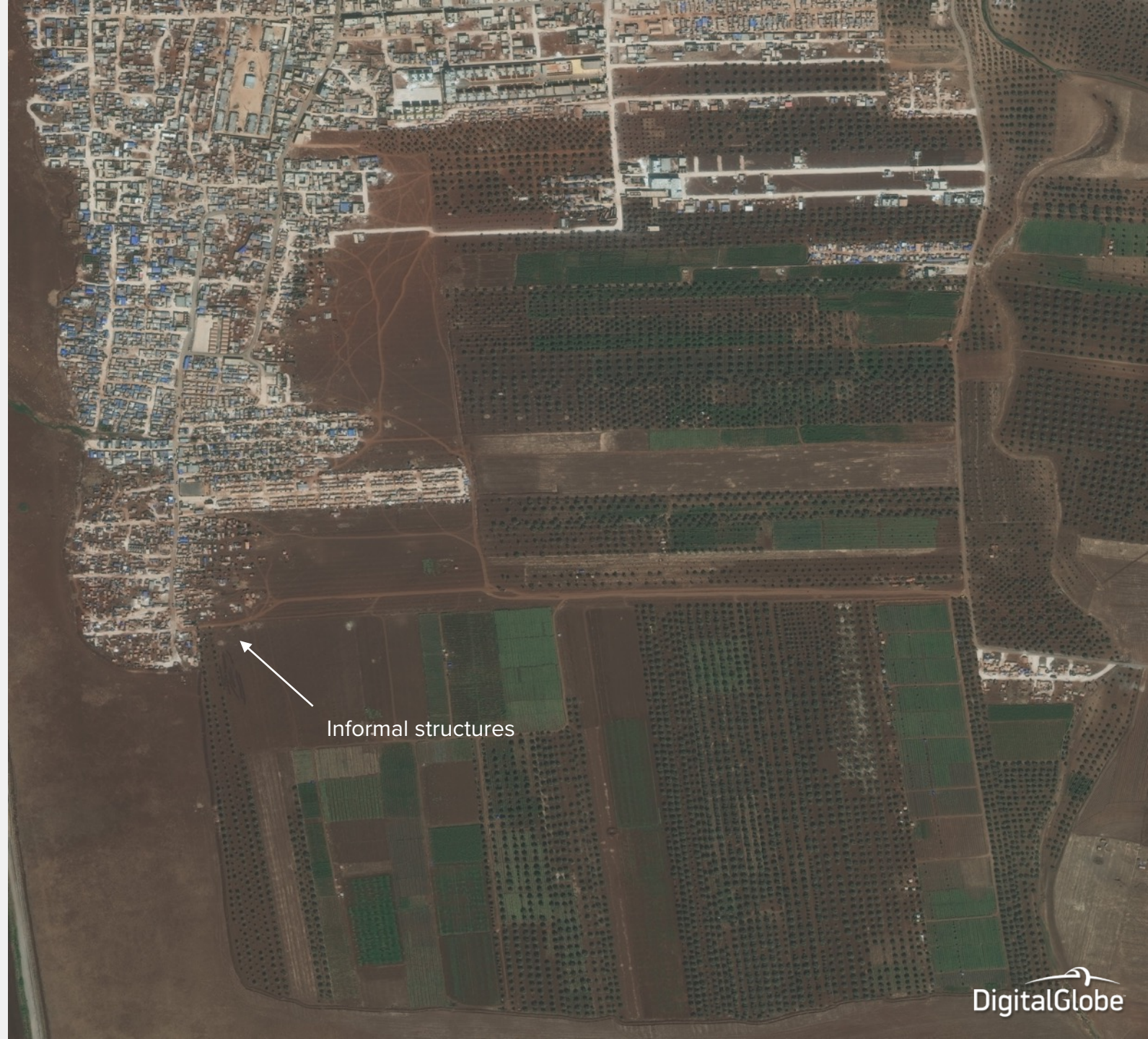
Displacement

The imagery captures changes visible in parts of two IDP camps across four dates between September 2017 and February 2020, which will be referred to as IDP Displacement Camp A and B. Analysts noted substantial changes at both locations, particularly pertaining to size, structure density, and physical feature characteristics. Structure density appears to grow acutely by 2019 compared to previous years. The clearly apparent increase in structure density is consistent with UN OCHA estimates that more than 948,000 Syrians have been displaced in northwest Syria since 1 December 2019, and that available shelters have been eclipsed by current need. Sixty percent of those displaced during that period were children; shelter is the most urgently identified need. The rapid rate of displacement instigated by the ongoing bombardment of populated civilian areas and infrastructure, including schools, compounds acute and overwhelming needs throughout this region.

Displacement Camp A, Idlib Governorate

In September 2017, the IDP camp established to date was primarily concentrated in the NW of the image and was in close proximity to agricultural fields to the east. The structures appear heterogeneous in size, coloring, and material. Large parts of the camp appear to be formalized and organized, and there are road connections visible in close proximity to the densely settled areas.

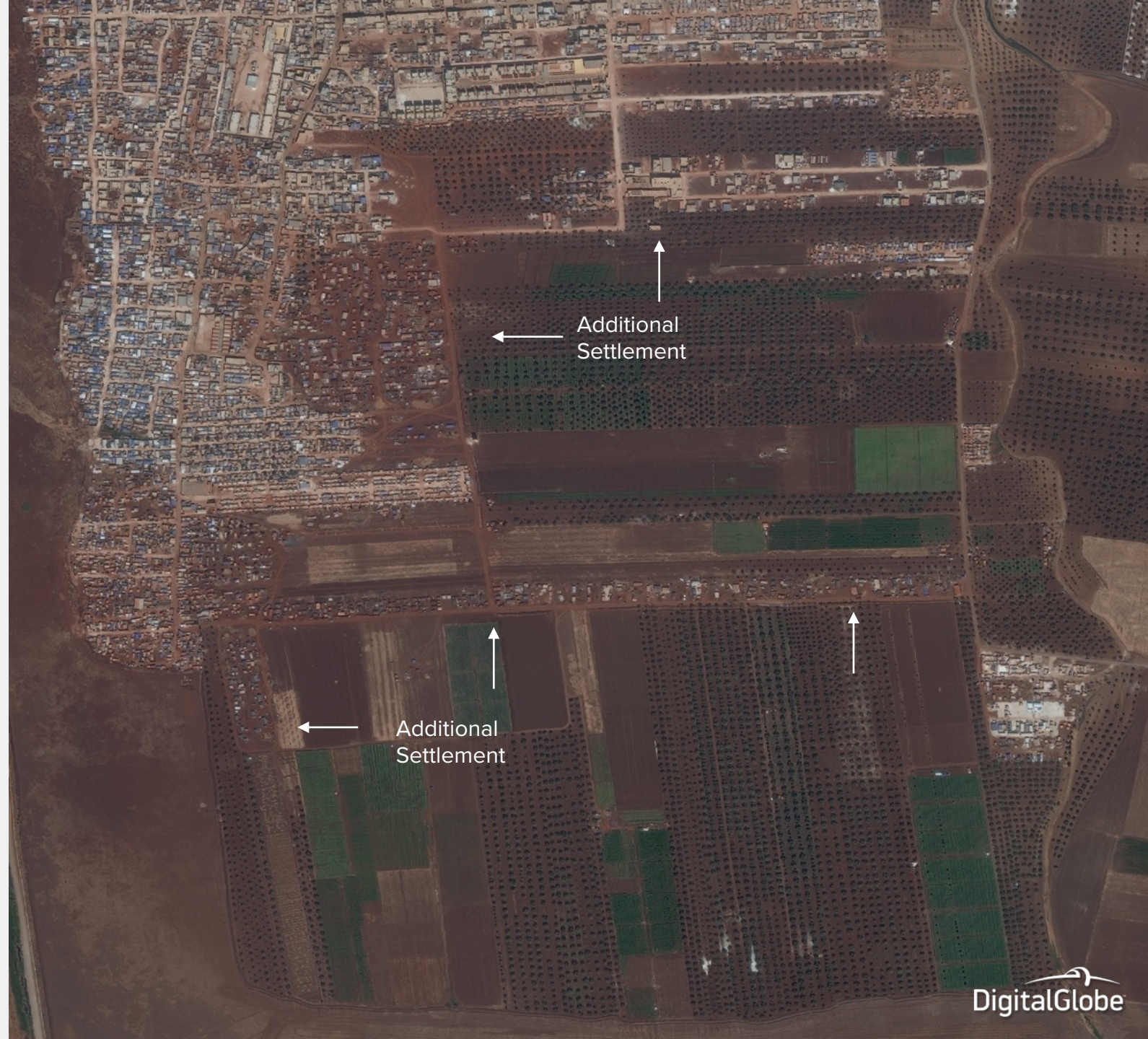
Around the edges of the camp, particularly in the SW, there is a concentration of unorganized, smaller, informal structures. This cluster of structures is consistent with a self-settled and spontaneous camp. Singular informal structures are also visible in the agricultural fields around the camp.



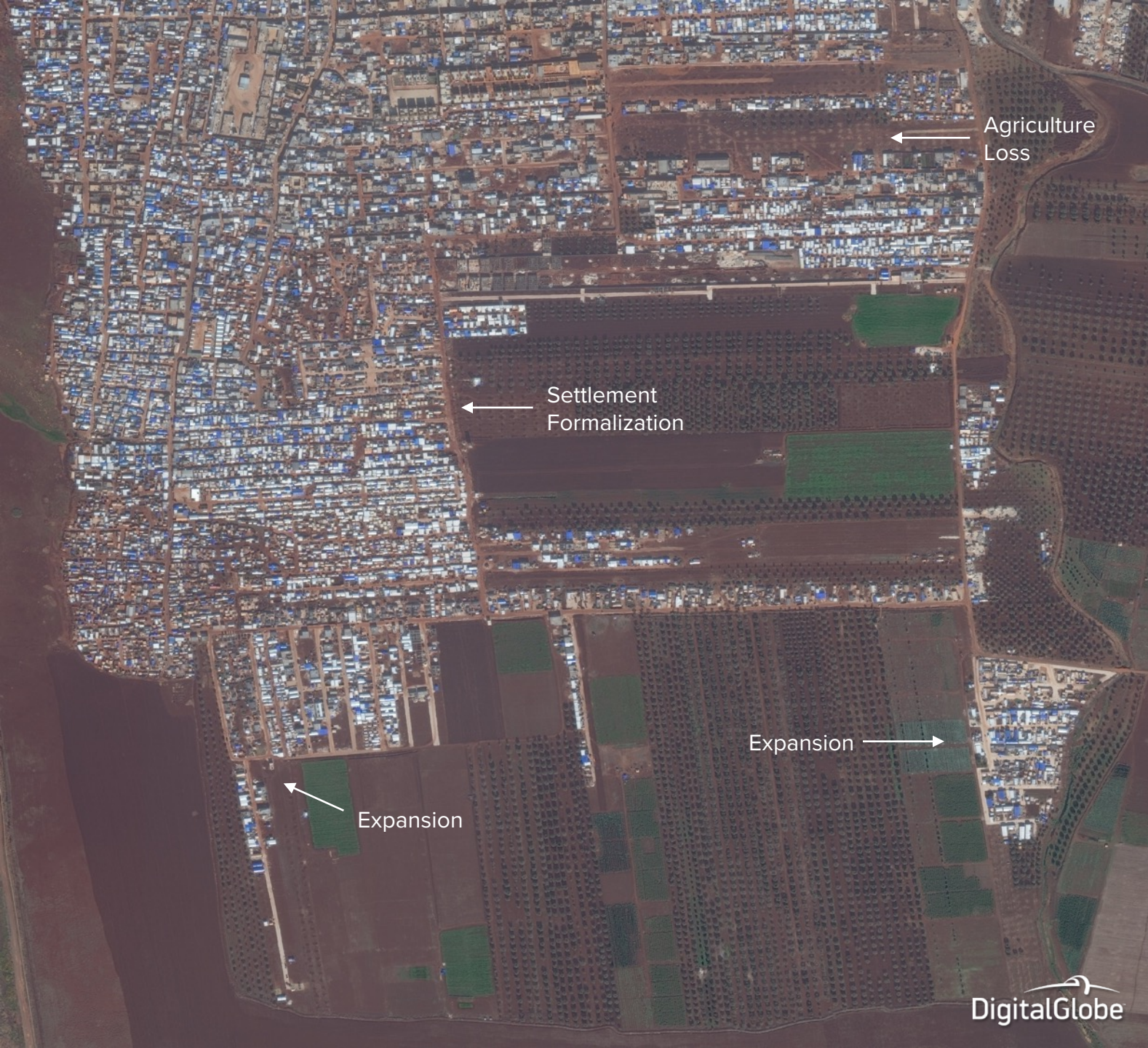
Informal structures

In September 2018, additional self-settled populations lined the edges of the established camp in large numbers. These newly added structures resemble the informal structures previously seen bordering the southern parts of the camp in September 2017. The added temporary structures between 2017 and 2018 appear smaller compared to the older, more well-established parts of the camp. There are no established road networks, and there is little apparent organization of visible structures; this may be consistent with recent arrivals.

The road networks visible in both September 2017 and 2018 are increasingly bordered by development in 2018.



Between 2018 and 2019, the same areas that expanded with informal settlement the prior year became more formalized. The temporary structures visible in 2018 appear to have been replaced by larger, more permanent structures with sturdy roofing by 2019. The expansion continues to take over former agricultural fields; the removal of orchard trees may indicate further planned expansion.



Between December 2019 and February 2020, additional construction is visible. New building foundations have been laid, and several structures that were undergoing construction in December 2019 have roofs by February 2020.

There are also several structures without roofing in December 2019 that are not completed by February 2020.



The structures throughout displacement camp A are heterogeneous in size, coloring, and material. Agricultural fields border large parts of the camp, and here there is a clearing in between. Track marks are visible, but the space is not occupied by structures.



Fig 2.a. IDP Camp, Idlib Governorate
27 September 2017

Satellite imagery ©2020 DigitalGlobe

By September 2018, the previously empty space becomes occupied by several structures consistent with the physical characteristics of a self-settled and spontaneous camp. Several structures appear among the trees beyond the previously unoccupied space.



Fig 2.b. IDP Camp, Idlib Governorate
26 September 2018

Satellite imagery ©2020 DigitalGlobe

The temporary structures visible in 2018 appear to have been replaced by larger, more permanent structures with sturdy roofing by December 2019. The area becomes more densely occupied and expansion toward the east replaces agricultural fields still visible in the image captured in September 2018.



Fig 2.c. IDP Camp, Idlib Governorate
2 December 2019

Satellite imagery ©2020 DigitalGlobe



27 September 2017



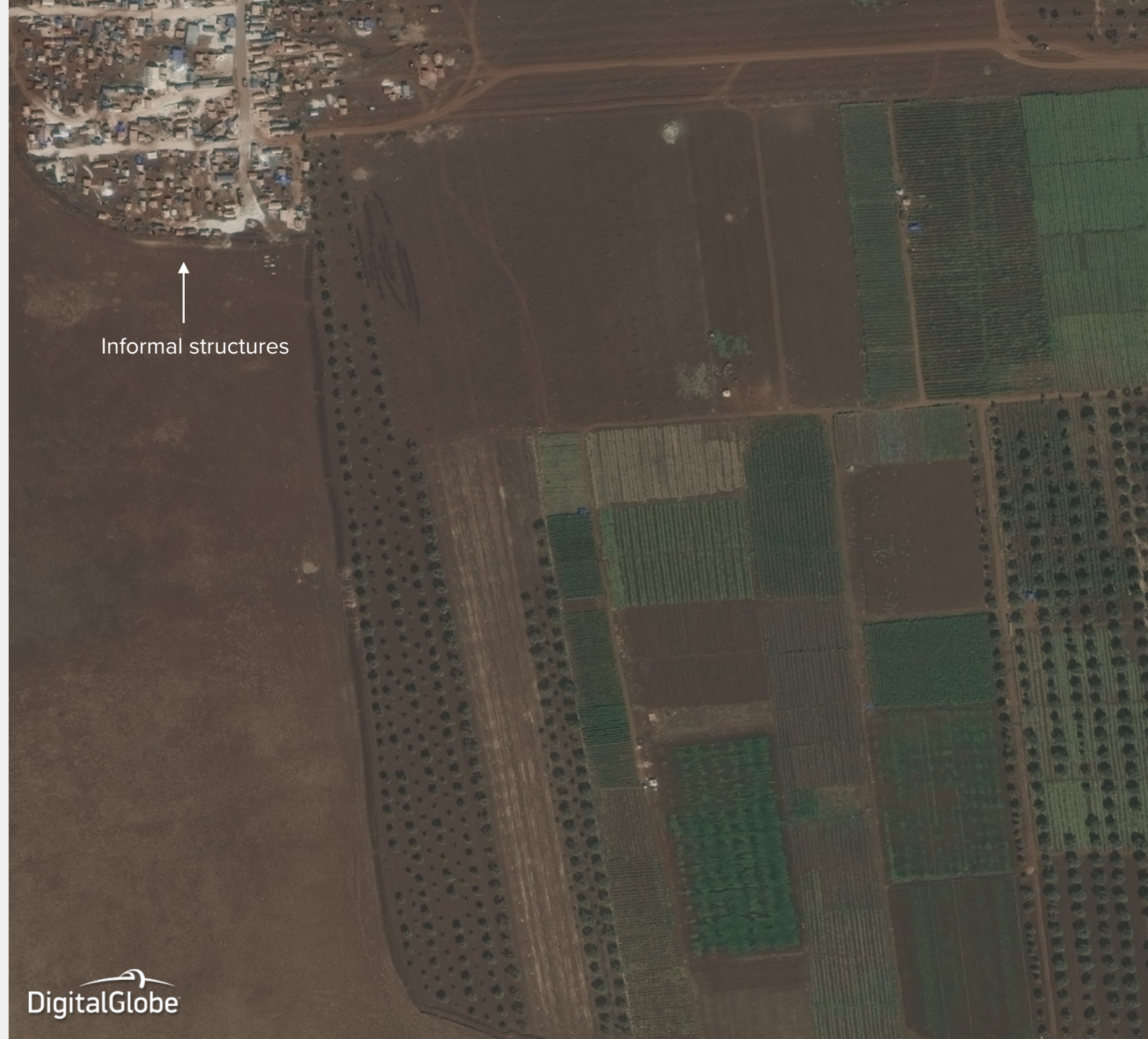
26 September 2018



2 December 2019

Fig 2.d. Informal to Formal IDP Camp Expansion, Idlib Governorate
Composite of Figs 2a/b/c. Satellite imagery acquired 27 September 2017 (2.a), 26 September 2018 (2.b), 2 December 2019 (2.c).

In September 2017, there is a concentration of informal structures in the SW of the camps, near agricultural fields. Several structures are visible throughout the farmed land.



Informal structures

Fig 3.a. IDP camp site and agricultural land, Idlib Governorate
27 September 2017

Satellite imagery ©2020 DigitalGlobe

By September 2018, there has been a substantial increase of self-settled populations based close to and often on land that appeared to have formerly been used for agriculture.

Fig 3.b. IDP camp site expansion into agricultural land, Idlib Governorate
26 September 2018

Satellite imagery ©2020 DigitalGlobe

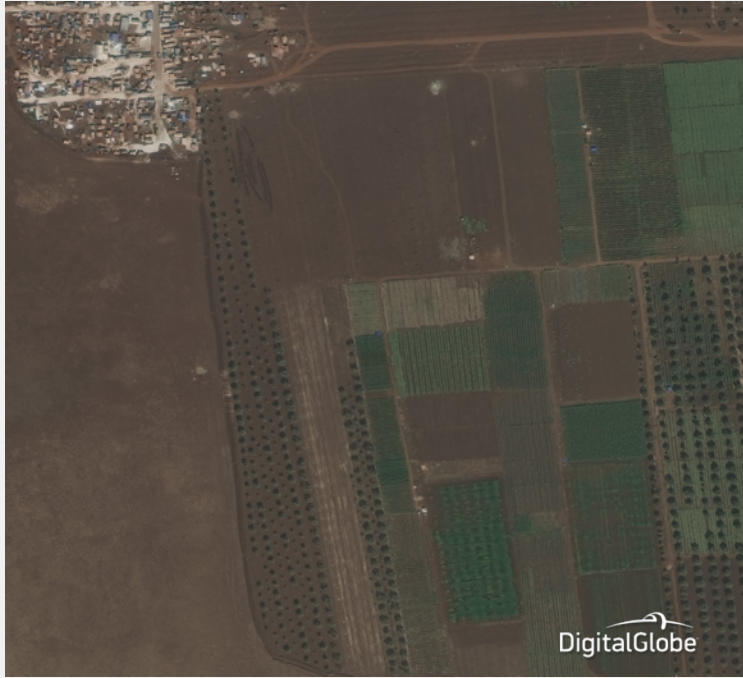


By December 2019, the landscape has substantially changed. The change is consistent with increased structure density, structure formalization, camp expansion, and conversion of agricultural land.

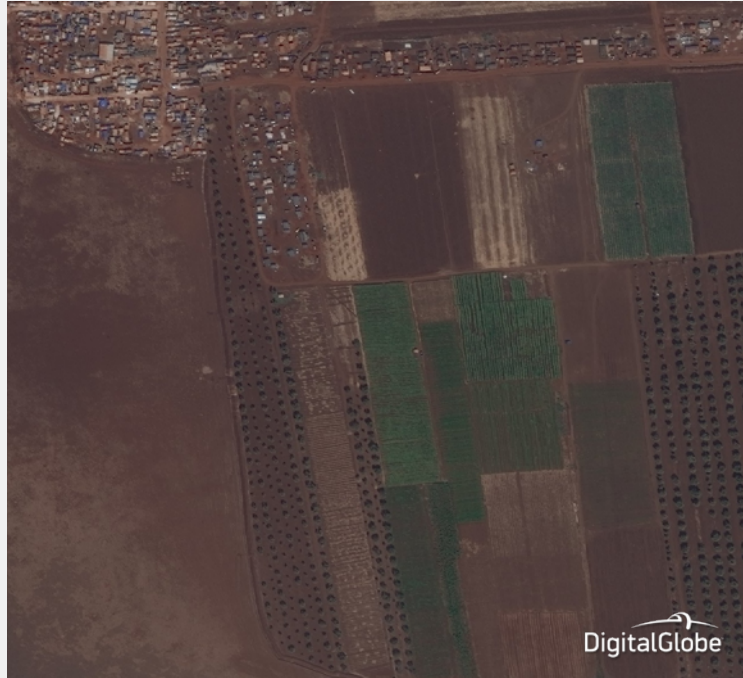
Fig 3.c. IDP camp site formalization, expansion into agricultural land, Idlib Governorate
2 December 2019

Satellite imagery ©2020 DigitalGlobe





27 September 2017



26 September 2018

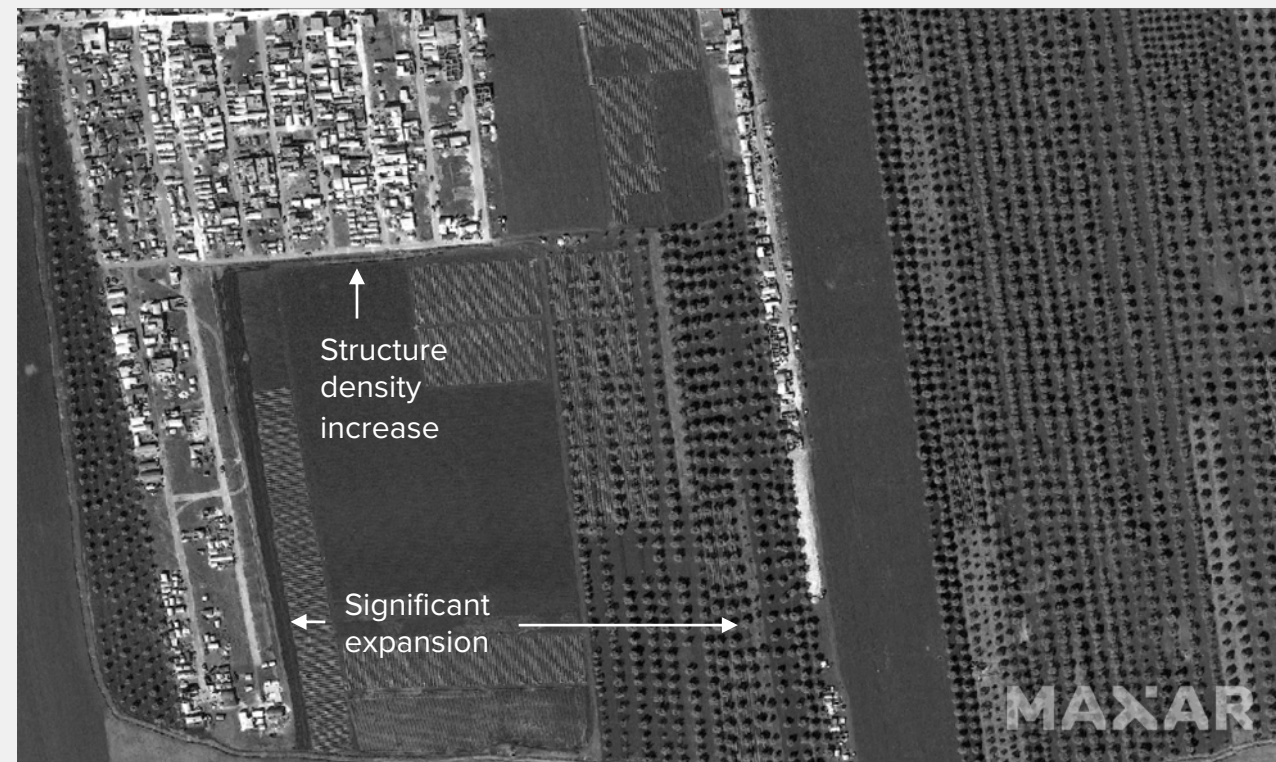


2 December 2019

Fig 3.d. IDP camp expansion into former agricultural land, 2017-2019, Idlib Governorate
Composite of Figs 3a/b/c. Satellite imagery acquired 27 September 2017 (3.a), 26 September 2018 (3.b), 2 December 2019 (3.c).
Satellite imagery ©2020 DigitalGlobe



2 December 2019



26 February 2020

Fig 3.e. IDP camp expansion into former agricultural land over 86 days, Dec 2019 – Feb 2020, Idlib Governorate
In less than three months, structure density and settlement area expands significantly. IDPs who may be sheltering among agriculture groves, without tarps or other cover, cannot be identified using satellite imagery alone. The apparent expansion may underrepresent the real population growth at this site.



Fig 3.f. IDP camp expansion into former agricultural land.

2 December 2019



26 February 2020

Parts of the camp appear to be formalized and organized, with apparent connecting roads throughout.



Fig 4.a. IDP camp site and agricultural land, Idlib Governorate
27 September 2017

Satellite imagery ©2020 DigitalGlobe

By September 2018, areas that were previously unoccupied appear to be undergoing construction and there appears to be additional small structures clustered in various areas.



Fig 4.b. IDP camp site expansion into agricultural land, Idlib Governorate 26 September 2018

Satellite imagery ©2020 DigitalGlobe

As seen in previous figures, by December 2019 there appears to be substantial formalization of structures as well as additional development. Where trees previously stood in September 2018 now mirror physical characteristics that are consistent with upturned earth, suggest that the trees may have been removed.

Fig 4.c. IDP camp site formalization, expansion into agricultural land, Idlib Governorate
2 December 2019

Satellite imagery ©2020 DigitalGlobe





27 September 2017



26 September 2018



2 December 2019

Fig 4.d. IDP camp expansion into former agricultural land, 2017-2019, Idlib Governorate
Composite of Figs 4a/b/c. Satellite imagery acquired 27 September 2017 (3.a), 26 September 2018 (3.b), 2 December 2019 (3.c).



Fig 5. Construction of new structures underway, Idlib Governorate | 2 December 2019

Additional building foundations are also visible: outside walls and room divisions are visible, and a roof does not appear to have been placed. The length of the shadows cast by the structures are considerably tall and could potentially be more than one story in height.

Displacement Camp B, Idlib Governorate

Fig 6.a. Displacement camp B, Idlib Governorate
27 September 2017



Fig 6.b. Displacement camp B, Idlib Governorate
27 September 2017



Fig 6c. Displacement camp B, Idlib Governorate
27 September 2017





27 September 2017



26 September 2018



2 December 2019

Fig 6.d. IDP camp formalization, expansion, and density increase, Idlib Governorate

Although growth is apparent between 2017 and 2018, by 2 December 2019 this site has expanded at a far more rapid pace consistent with reports of IDP influx.

Satellite imagery ©2020 DigitalGlobe



Fig 7a. Displacement camp B (detail), Idlib Governorate | 27 September 2017



Fig 7c: IDP camp expansion of informal settlement, Idlib Governorate
27 September 2017



Fig 7c. Formalization, expansion and density increase, Idlib Governorate
27 September 2017



27 September 2017



26 September 2018



2 December 2019

Fig 7.d. IDP expansion, formalization and density increase 2017-2019, Idlib Governorate

Meaningful but relatively modest growth between 2017 and 2018 is dwarfed by the increase in overall camp size, formalization and density by late 2019.

Fig 8. Camp expansion and formalization, Idlib Governorate



26 September 2018



2 December 2019

Fig 9. Camp growth and formalization,
Idlib Governorate

2 December 2019



26 September 2018

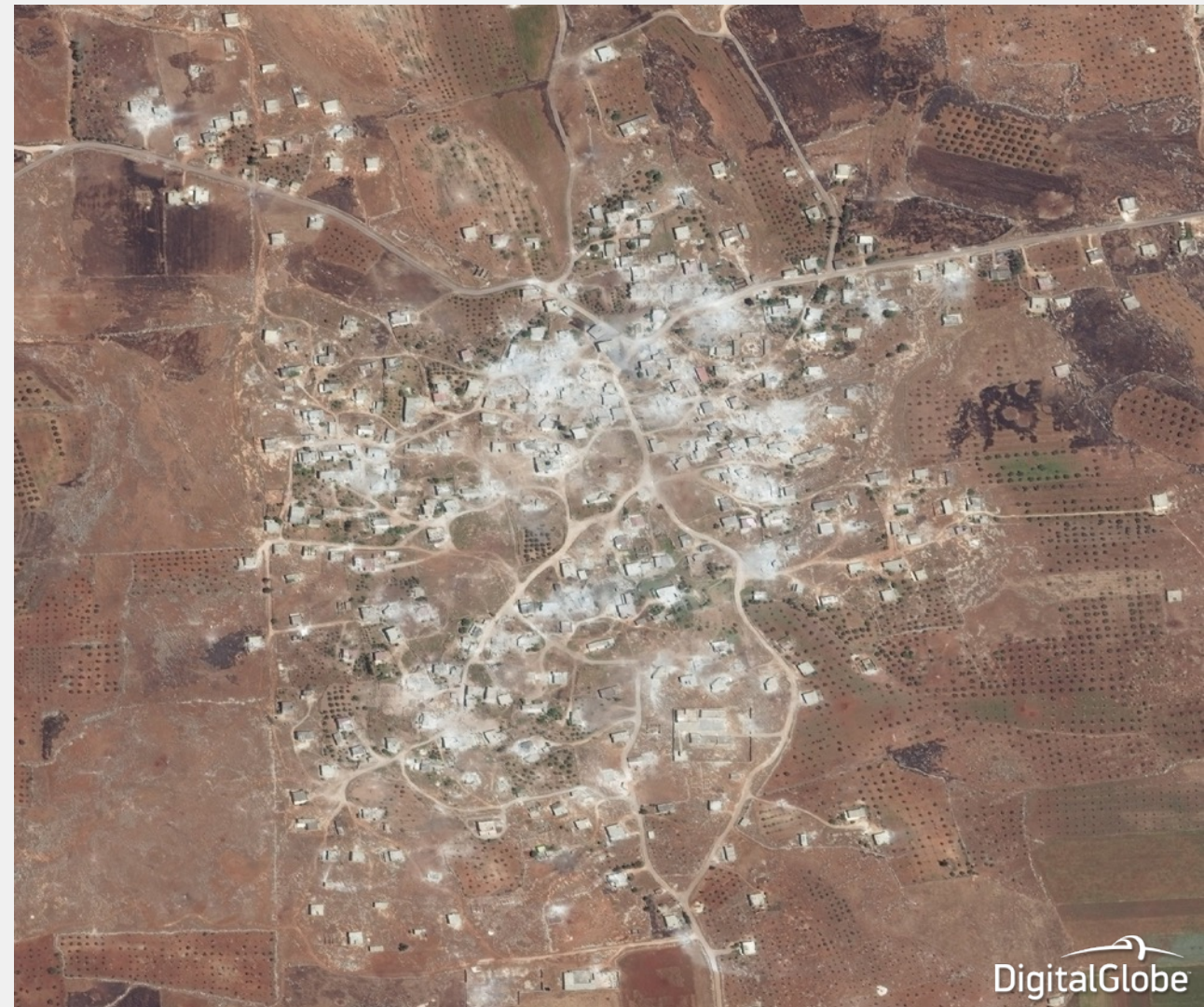


Structural Damage and Destruction

The imagery of structural damage in Southern Idlib captures the changes in the landscape between July 2018 and May 2019. Satellite imagery most clearly captures damage from above - particularly damage as a result of aerial bombardment. Ground offensives and shelling may produce structural damage not apparent from satellite imagery. This analysis may not, therefore, capture the entire extent of the damage in the analyzed area. The areas analyzed are referred to as Locations C and D.



20 July 2018



26 May 2019



20 July 2018

DigitalGlobe



26 May 2019

DigitalGlobe



20 July 2018



26 May 2019

Fig 3.e. Cratering consistent with aerial bombardment, Idlib Governorate

In imagery acquired 26 May 2019, cratering consistent with aerial bombardment appears at this site. Indications of scorched earth appear consistent with secondary fire caused by aerial bombardment, causing damage to surrounding crops.

Apparent Aerial Bombardment

Approximately 30% of the structures at Location C and D appear significantly damaged or obliterated, while the ground surrounding the structures remains largely intact. Ground reports suggest that the settlements in the analyzed region are no longer populated. While the satellite imagery indicates that a third of the settlements are destroyed, the imagery cannot verify the presence or absence of people. In the immediate surroundings of the structures in Locations C and D, there is visible evidence consistent with cratering as a result of mortar shelling and aerial bombardment. In May 2019, an active smoke plume as a result of fire is still visible at Location D. There appear to be track marks across the fields as well, though the timing of the tracks and craters may be unrelated.



20 July 2018



26 May 2019

Fig 14.a. Apparent aerial bombardment, Idlib Governorate
Large craters consistent with aerial bombardment appear in the fields beyond the town; scorched earth due to secondary fires caused by bombardment is apparent, as a smoke plume rises from a still-burning plot of land. Smaller craters may be due to other, smaller forms of bombardment (e.g. mortars). Extensive damage to structures throughout the town is evident and consistent with aerial bombardment. It is important to note that not all structural damage may be evident via satellite imagery, as damage from shelling may render buildings unusable but still partially standing.



Acknowledgments

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