Report of Monitoring and Assessment of Desert Locust in Africa and Asia

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Desert Locust Monitoring and Loss Assessment in Yemen and Saudi Arabia (May, 2023)

Integrated with multi-source Earth Observation data, e.g. meteorological data, field data, and remote sensing data (such as MODIS in the US, and Sentinel series in EU, etc), and self-developed models and algorithms for Desert Locust monitoring and forecasting, the research team constructed the 'Vegetation pests and diseases monitoring and forecasting system', which could regularly release thematical maps and reports on Desert Locust.

This report focuses on the dynamics of desert locust monitoring and loss assessment in Yemen and Saudi Arabia. The remote sensing monitoring results showed that, in May 2023, the desert locusts were mainly distributed in western Yemen and along the Red Sea coast of western Saudi Arabia. The total damaged vegetation areas in Yemen and Saudi Arabia were 40.3 and 18.9 thousand hectares, respectively. It is expected that in the next two months, Saudi Arabia will experience high temperatures and dry conditions, while the meteorological conditions in Yemen will be more suitable for the survival of desert locusts. As a result, some locust swarms in Saudi Arabia will migrate southward to the inland areas of Yemen, and the number of locusts in Saudi Arabia will decrease. Some locusts in western Yemen will also migrate to inland areas for breeding and egg-laying, leading to an increase in the number of locusts in Yemen. This period is the important planting and growth seasons for crops in Yemen and the growth and harvest seasons for crops in Saudi Arabia. It is still necessary to pay continuous attention to the dynamics of the desert locust disaster in Yemen and Saudi Arabia to prevent losses to its agricultural and pasture production. The specific research results are as follows.

■ **1. Desert Locust Monitoring and Loss Assessment in Yemen**

The monitoring results showed that in May, the total damaged vegetation area was 40.3 thousand hectares in Yemen, including 1.3 thousand hectares of cropland, 8.4 thousand hectares of grassland, and 30.6 thousand hectares of shrub (Figure 1), accounting for 0.2%, 2.9%, and 0.8% of the total area of the cropland, grassland, and shrub, respectively. Compared with April 2023, the newly damaged vegetation area was 28.7 thousand hectares, including 1.3 thousand hectares of cropland, 6.6 thousand hectares of grassland, and 20.8 thousand hectares of shrub. Hajjah province had the largest area of vegetation affected, with 22.0 thousand hectares. Followed by Amrān province, with 10.3 thousand hectares of vegetation affected. The affected areas of vegetation in Al-Hudaydah and Al Jawf provinces were 7.5 and 0.5 thousand hectares, respectively.
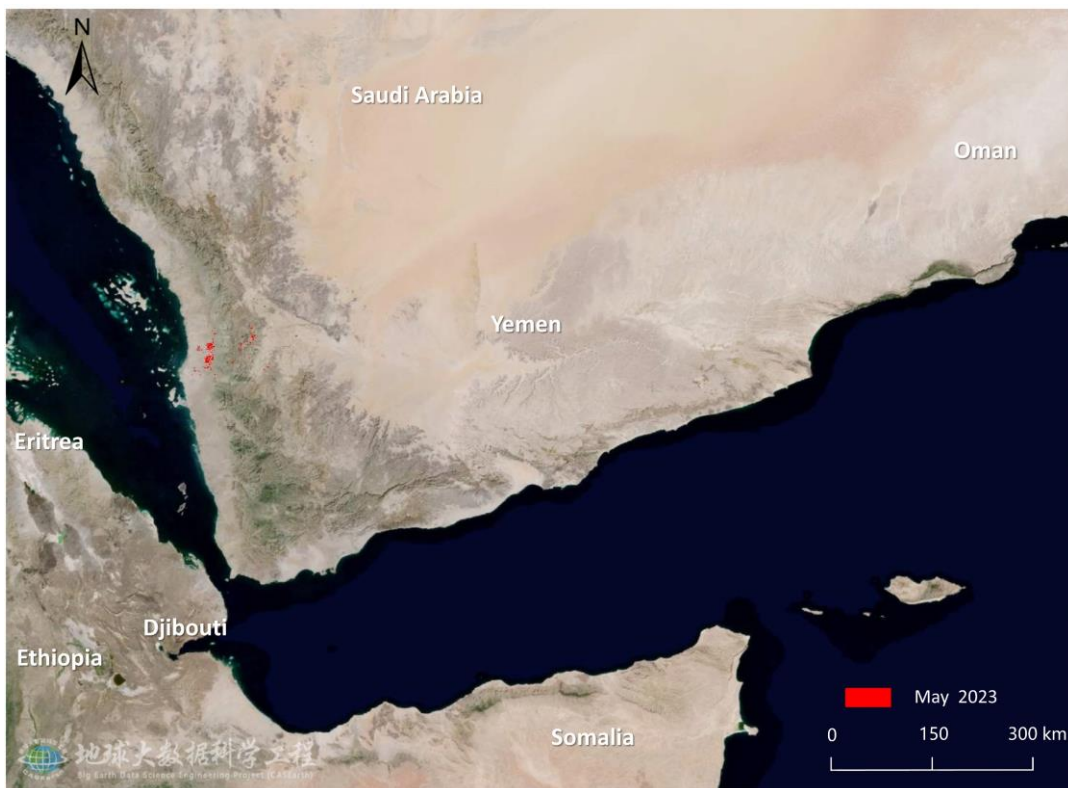
Fig. 1 Monitoring of Desert Locust damage in Yemen (May 2023)

■ **2. Desert Locust Monitoring and Loss Assessment in Saudi Arabia**

In May 2023, due to control operations, the number of desert locusts along the Red Sea coast of western Saudi Arabia decreased. The remote sensing monitoring results showed that in May, the total damaged vegetation area in Saudi Arabia was 18.9 thousand hectares, including 8.7 thousand hectares of cropland, 3.2 thousand hectares of grassland, and 7.0 thousand hectares of shrub (Figure 2), accounting for 0.4%, 0.8%, and 0.4% of the total area of the cropland, grassland, and shrub in Saudi Arabia, respectively. Compared with April 2023, the newly damaged vegetation area was 6.3 thousand hectares, including 2.2 thousand hectares of cropland, 1.5 thousand hectares of grassland, and 2.6 thousand hectares of shrub. Makkah province had the largest area of vegetation affected, with 16.9 thousand hectares.

The affected areas of vegetation in Al Madīnah and Tabūk provinces were 1.9 and 0.1 thousand hectares, respectively.

Fig.2 Monitoring of Desert Locust damage in Saudi Arabia (May 2023)

This study also used Sentinel-2 satellite remote sensing data to monitor the desert locust damage in the severely damaged vegetation areas along the Red Sea coast in western Saudi Arabia (Figure 3). The study area is located in the Makkah province, 40.3 kilometers from Makkah City in the northwest and 80.0 kilometers from Al Lith City in the south. In the study area, the total vegetation area was 27.56 thousand hectares, and the affected area of vegetation was 10.36 thousand hectares, accounting for 37.6% of the total vegetation area. Among them, the affected area of cropland was 4.51 thousand hectares, the affected area of grassland was 1.01 thousand hectares, and the affected area of shrub was 4.84 thousand hectares, accounting for 60.1%, 63.9%, and 26.2% of the total area of cropland, grassland, and shrub in the region, respectively.
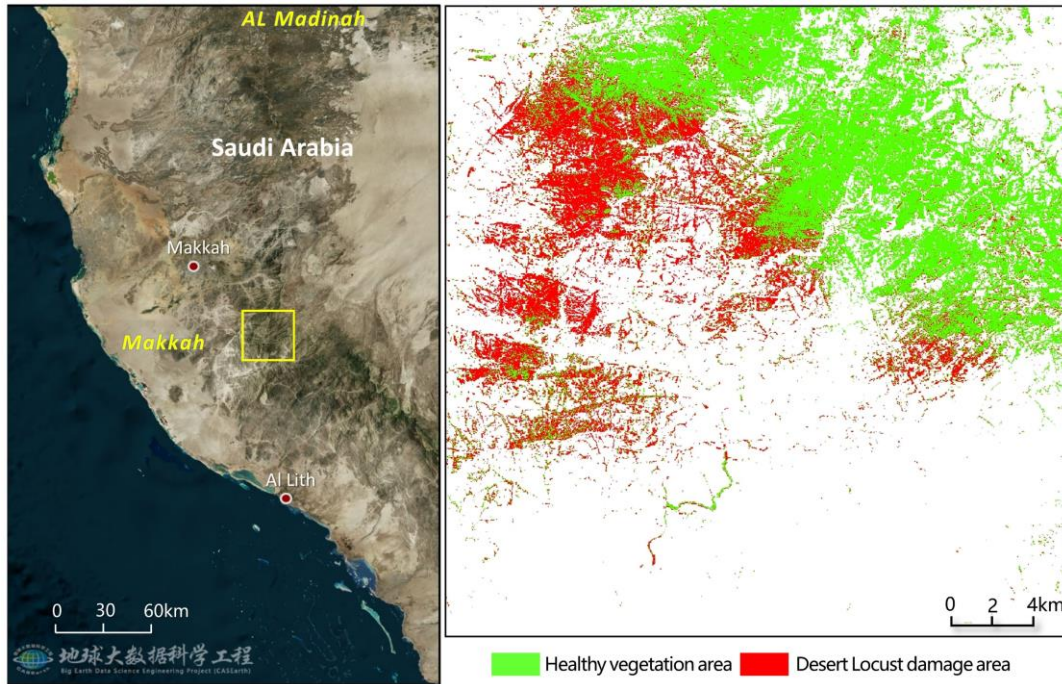
Fig. 3 Monitoring of Desert Locust damage in the key damage areas of Saudi Arabia based on Sentinel-2 images (May 2023)

The comprehensive analysis shows that, in the next two months, it is expected that the temperature in Saudi Arabia will continue to rise, accompanied by drought conditions, while in contrast, the climate in Yemen will be more suitable and vegetation relatively abundant. As a result, locust swarms in Saudi Arabia will migrate southward to the inland areas of Yemen, leading to a decrease in the number of locusts within Saudi Arabia and an increase in the number of locusts within Yemen. It is still necessary to continue to pay attention to the dynamics of the desert locust disaster in Yemen and Saudi Arabia to prevent repeated losses to agricultural and pasture production.

Citation

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