



## CASE STUDY

# Operationalization of the Regional Drought Mechanism Mongolia

To help address the challenges of drought monitoring, Mongolia became the first pilot country for ESCAP's Regional Drought Mechanism. The process began in 2013 following a request to ESCAP to pilot the Mechanism through the Mongolian National Remote Sensing Centre (NRSC) within the Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE). Through the RESAP network, ESCAP facilitated matching Mongolia's needs with the ability, from three Regional Service Nodes in China, India and Thailand in particular from Institute of Remote Sensing and Digital Earth (RADI) under the Chinese Academy of Sciences, to provide customizable tools and expertise to enhance the capacity for drought monitoring and analysis for decision-making in the crop farming, forest, and pastoral animal husbandry sectors in Mongolia (Figure 2).

RADI, recently renamed Aerospace Information Research Institute (AIR), developed the DroughtWatch System. This is a multi-satellite, multi-scale drought monitoring system that includes an auto-processing chain from satellite data downloading, pre-processing, index calculation, drought monitoring, statistics and analysis, and data management. Through a five-year developing and learning process, DroughtWatch-Mongolia was officially handed over to Mongolia, in September 2018, in full operation and having the ability to provide real-time drought monitoring for disaster prevention and mitigation. An exploration of this multi-year and multi-partner investment reveals how the Regional Drought Mechanism was tailored to local needs, with sustainability and future use in mind.

RADI provided training, DroughtWatch software after customization and calibration, relevant geospatial and climate data and expertise to tailor the drought monitoring tool to Mongolian conditions. This involved a series of capacity-building and technical training workshops for over 100 people by developing a manual, and a customized software dashboard. Drought products were distributed to all Mongolian provinces and AIR, along with local counterparts, conducted joint data processing. RADI provided on-the-job training for Mongolian counterparts (about 10 technical officials) during the customization, guidance for annual field surveys in selected



drought-prone provinces, calibration of the model and results validation processes. Furthermore, it hosted three Mongolian students, who were sponsored by a fellowship of the Chinese Academy of Sciences, to further enhance technical capacity in Mongolia and sustainability of the system.

The DroughtWatch-Mongolia can provide daily, 5-day, 10-day, monthly, and seasonal monitoring using over 40 drought composite methods with spatial variation and temporal dynamics. Mongolian technicians can fully operate the system on their own, monitor drought by themselves, and disseminate drought information to stakeholders throughout the country (<http://irimhe.namem.gov.mn> and <https://eic.mn/>). The outputs that the NRSC is producing, based on the DroughtWatch system, include real-time drought monitoring for disaster prevention and mitigation departments in Mongolia, servicing the Ministry of Nature, Environment and Tourism and the Ministry of Food, Agriculture and Light Industry and dissemination to local meteorological departments through an internal network. IRIMHE continues to conduct joint research with AIR to expand the system for dzud monitoring,<sup>1</sup> under the support of ESCAP Subregional Office for East and North-East Asia.

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<sup>1</sup> For example, a dzud or extreme weather event causing livestock mortality, due to the summer drought and subsequent harsh winter conditions, led to the death of over 7.5 million livestock, more than 17 per cent of livestock in the country in 2010. See United Nations. Office for Outer Space Affairs (OOSA), "Satellite-based system to monitor droughts/dzuds handed over to Mongolia," new and press release, 2 October 2018. Available at <https://reliefweb.int/report/mongolia/satellite-based-system-monitor-droughtsdzuds-handed-over-mongolia>

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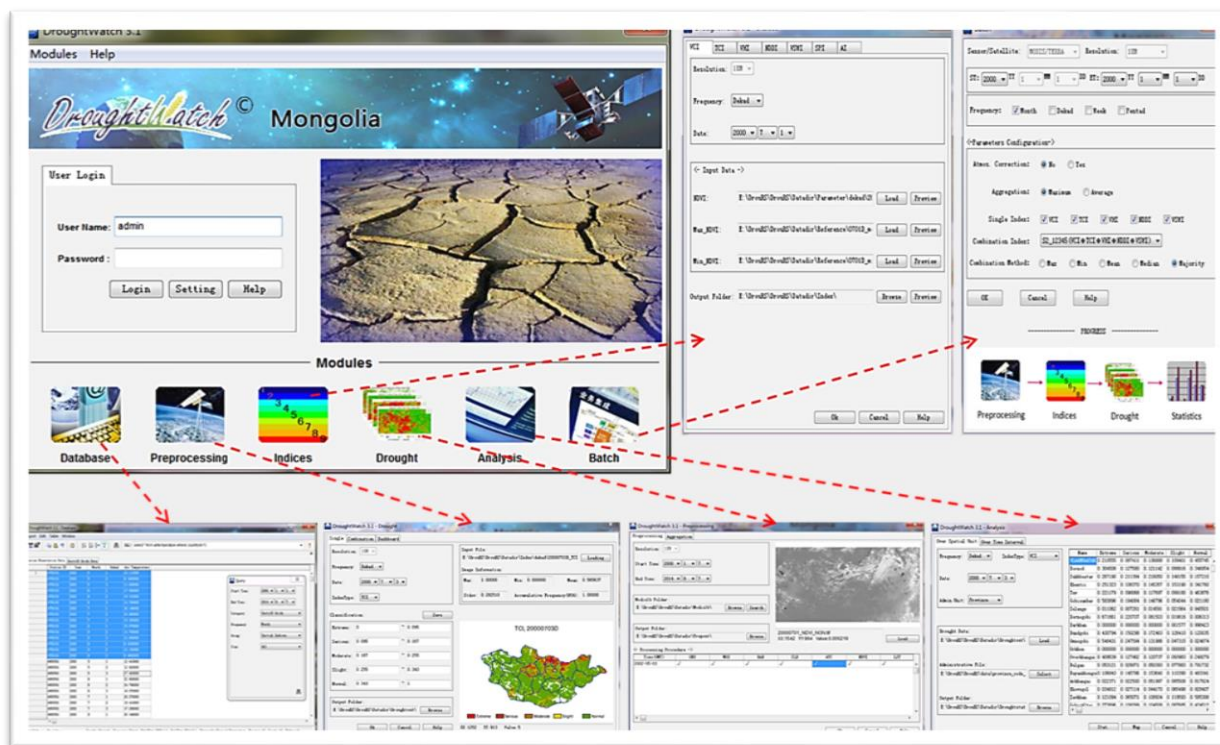
**Figure 1. Field mission in Mongolia, 2017**



**Source:** The Institute of Remote Sensing and Digital Earth (RADI), 2017.



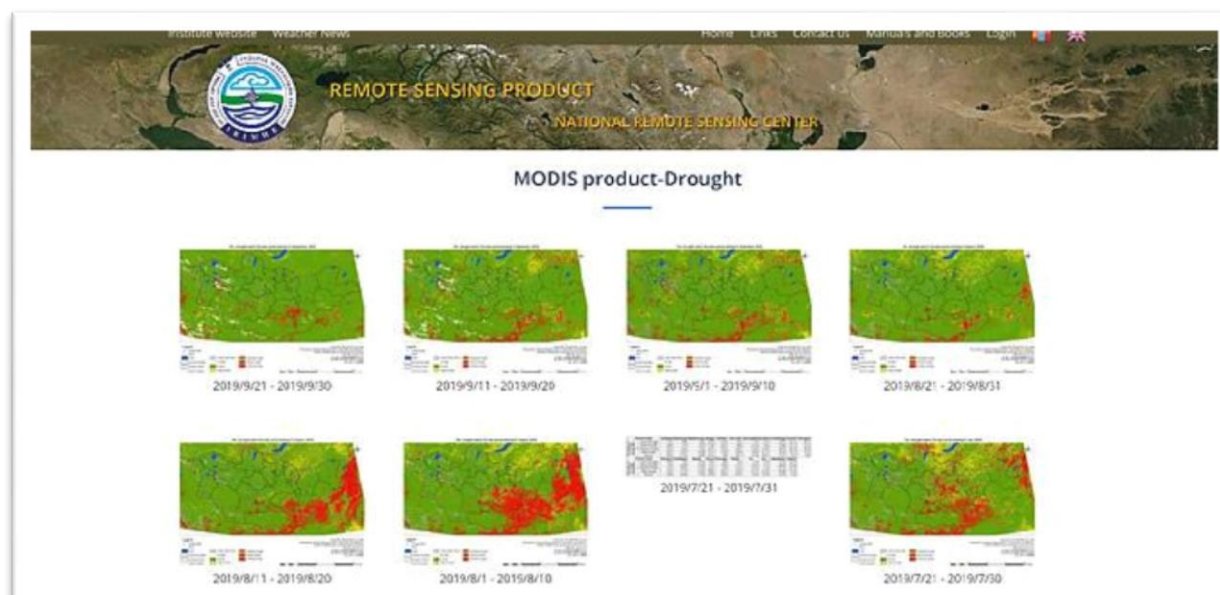
Figure 2. The DroughtWatch system customization for the Mongolian context and needs



Source: The Institute of Remote Sensing and Digital Earth (Radi).



**Figure 3. DroughtWatch-Mongolia products released on National Remote Sensing Center website**



**Source:** Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE), Remote Sensing Product, MODIS product-Drought. Available at <http://www.icc.mn/index.php?menuitem=5&datatype=mdro>

**Note:** The NRSC of Mongolia officially released the national drought monitoring report and information at Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE). Available at <http://irimhe.namem.gov.mn> and at [www.eic.mn](http://www.eic.mn)

**Disclaimer:** The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

Additional details and more practices like this can be found in [Geospatial Practices for Sustainable Development in Asia and the Pacific 2020: A Compendium](#)