

NASA Disasters Program's Response to the 2023 Türkiye/Syria Earthquakes

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NASA DISASTERS PROGRAM'S OVERVIEW

disasters.nasa.gov

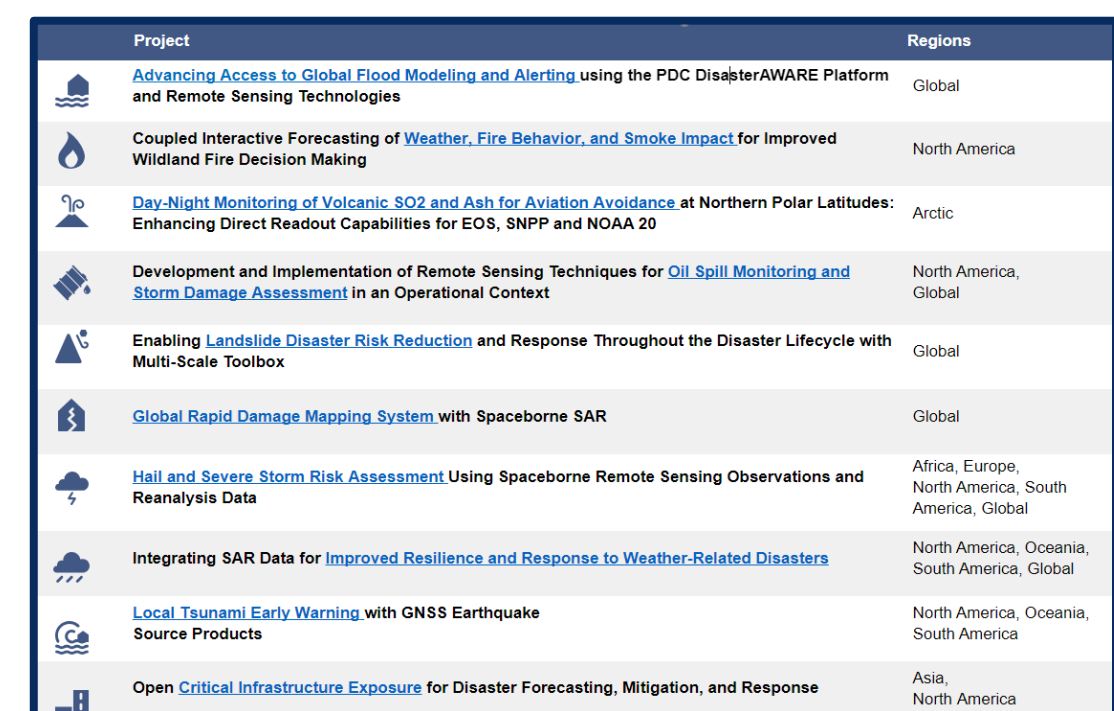


- ❖ We advance the field of disaster science and build open and accessible tools to help communities make smarter decisions for disaster planning.
- ❖ Before, during, and after disasters strike, our timely and free information and agile network of partners help communities worldwide reduce risk, improve response, hasten recovery, and build disaster resilience.
- ❖ We work directly with local governments and response teams to support disaster response efforts with Earth observing data and expertise.
- ❖ We foster partnerships around the world to build capacity and strengthen global disaster management efforts.

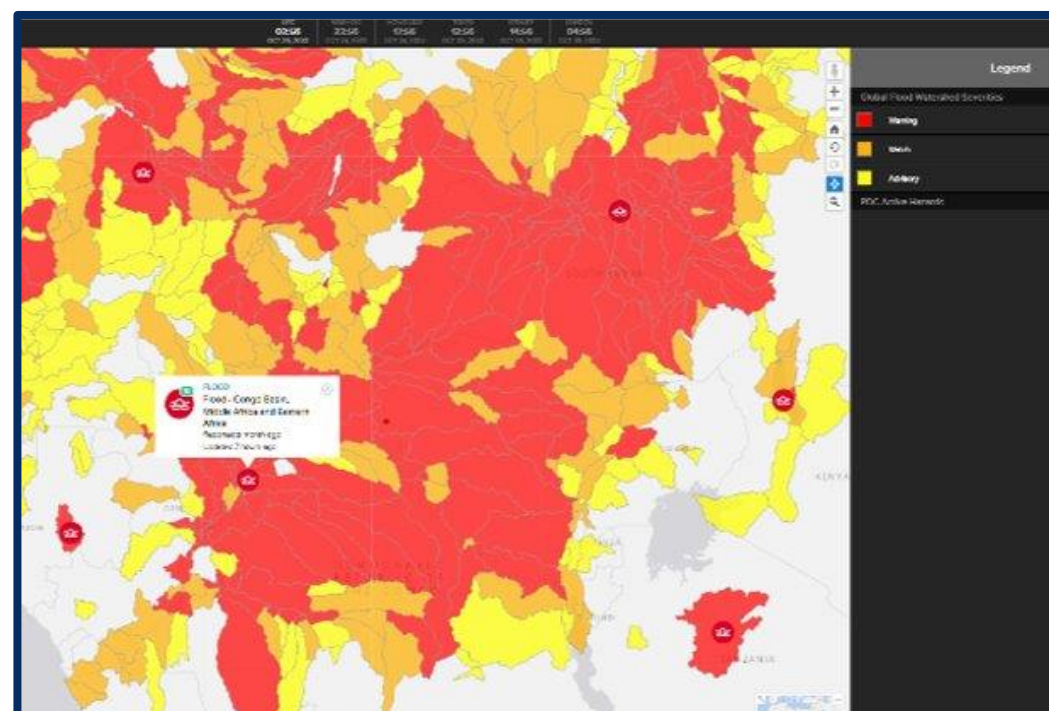


DISASTER APPLICATIONS

- ❖ Use Earth observations to **support decisions** throughout the disaster cycle, including risk reduction, preparedness, mitigation, early warning, response, recovery, and resilience.
- ❖ Develop **tools and technologies** to enable easier use and broader uptake.
- ❖ Improve communities' decision-making by **advancing disaster science and technology**, leveraging Earth observations with data on vulnerability, exposure, and coping capacity.



Examples of projects the NASA Disasters Program has funded.



Example of an application the NASA Disasters Program has funded for identifying areas at high risk of flooding.

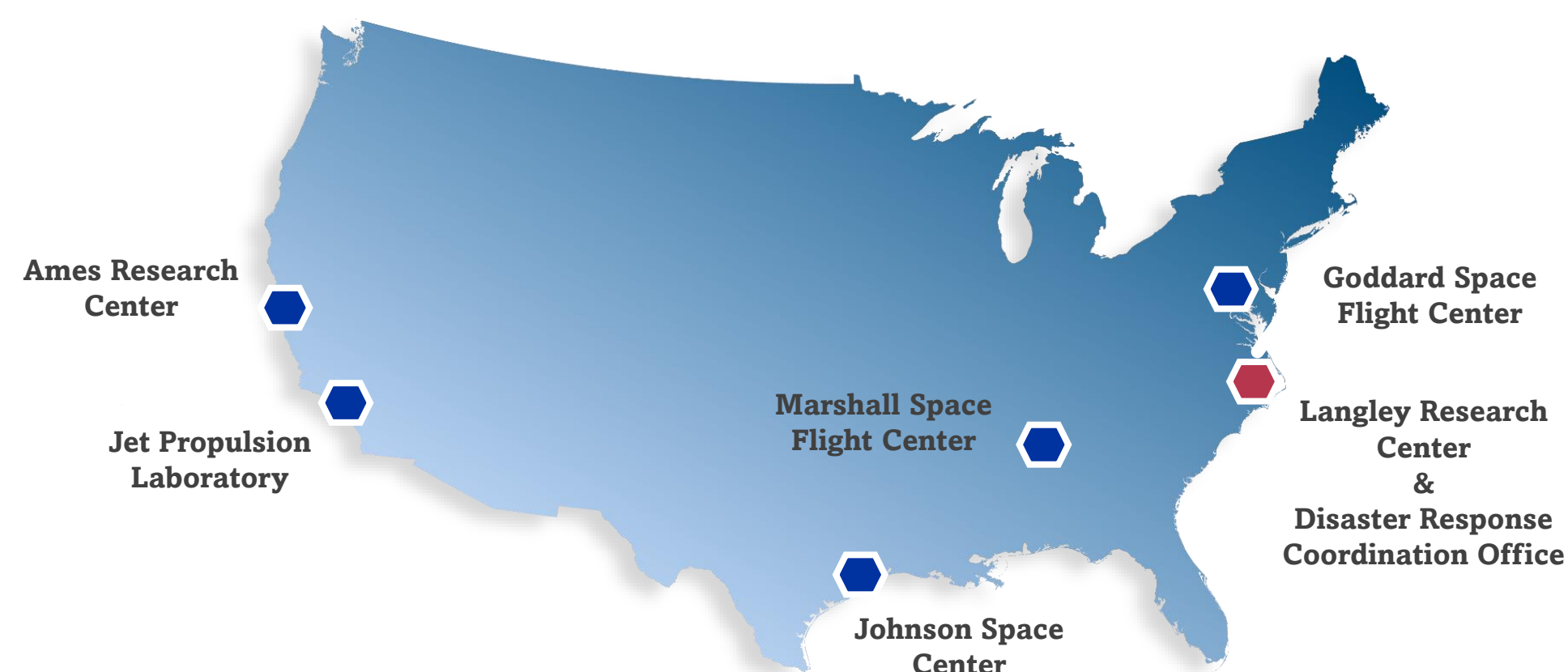


DISASTER RESPONSE COORDINATION SYSTEM

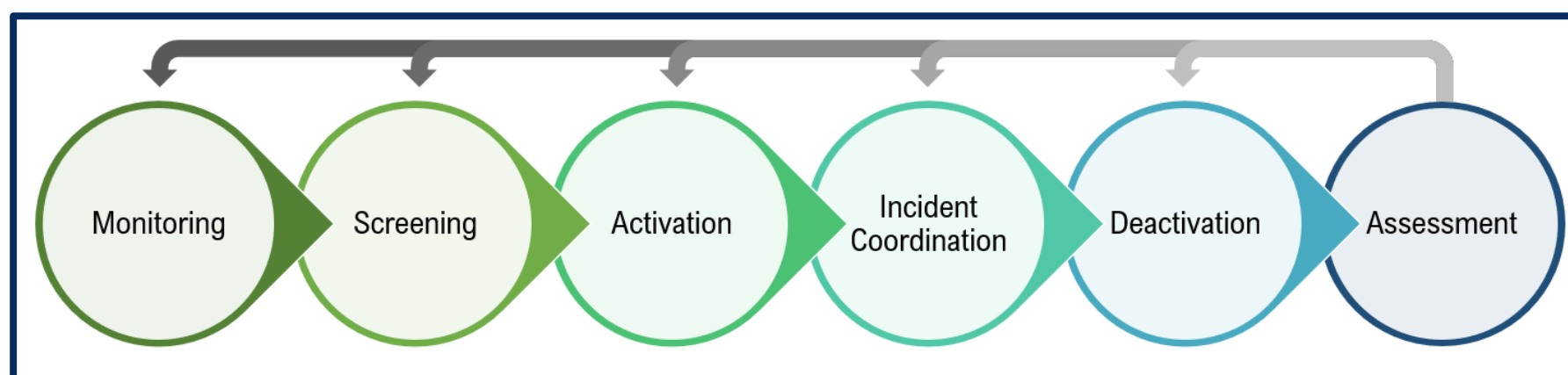
The NASA DRCS is a whole-of-NASA approach that leverages Earth science, technology, and expertise to provide trusted and actionable information to organizations actively responding to disasters. The DRCS works with government agencies, NGOs and private sector partners to provide insights that inform decision making and reduce impacts on lives and livelihoods.



disasters.nasa.gov/response



The DRCS is a whole-of-NASA approach, spread across multiple NASA centers while the program office is hosted at Langley Research Center.



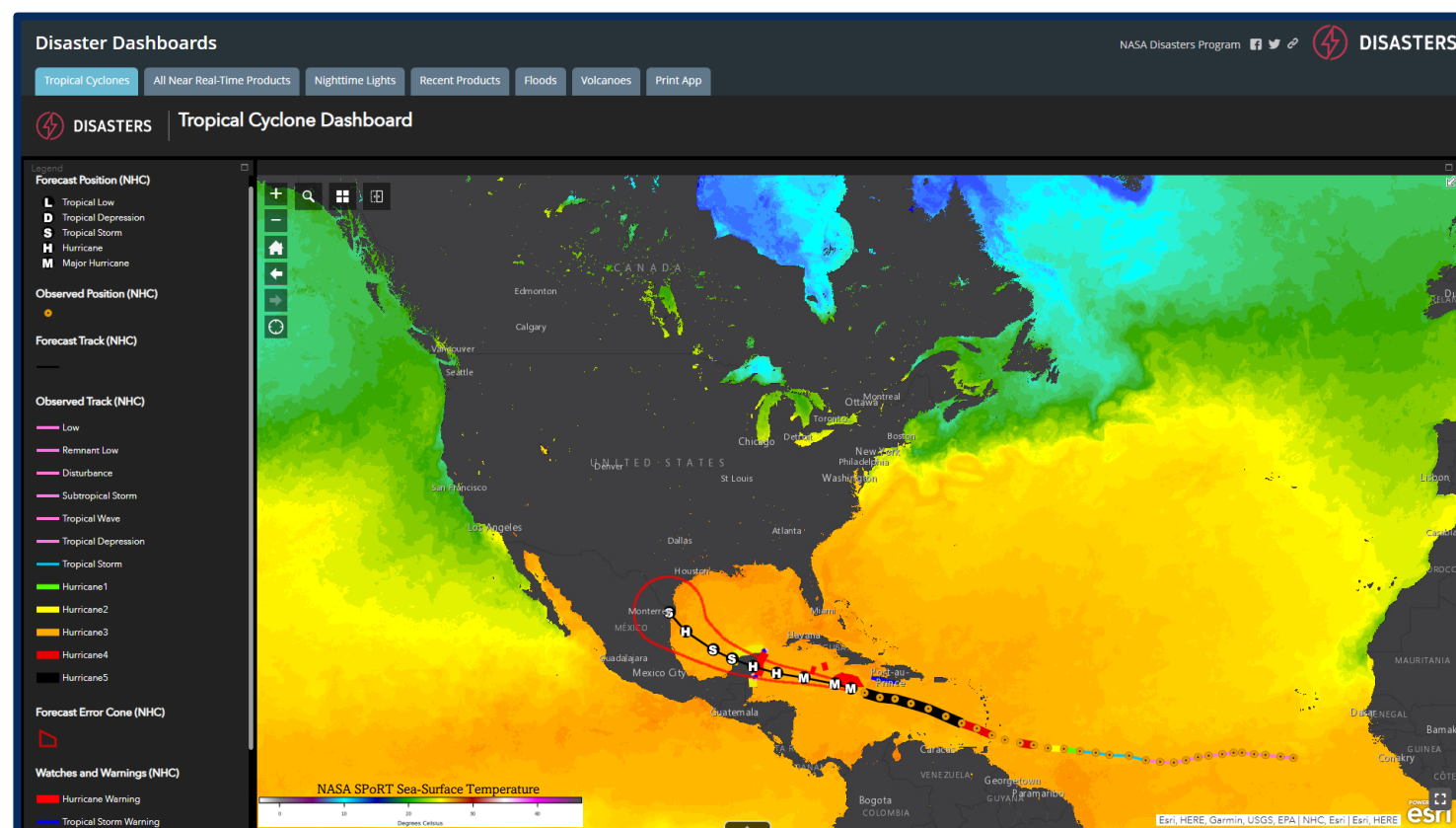
The DRCS response cycle throughout an activation.



DISASTERS MAPPING PORTAL

The Disasters Mapping Portal is a free and open **geographic information systems (GIS)** portal hosting a wide array of disaster products and near real-time dashboards. It serves as the primary interface for sharing maps, data, and analysis with response stakeholders.

maps.disasters.nasa.gov



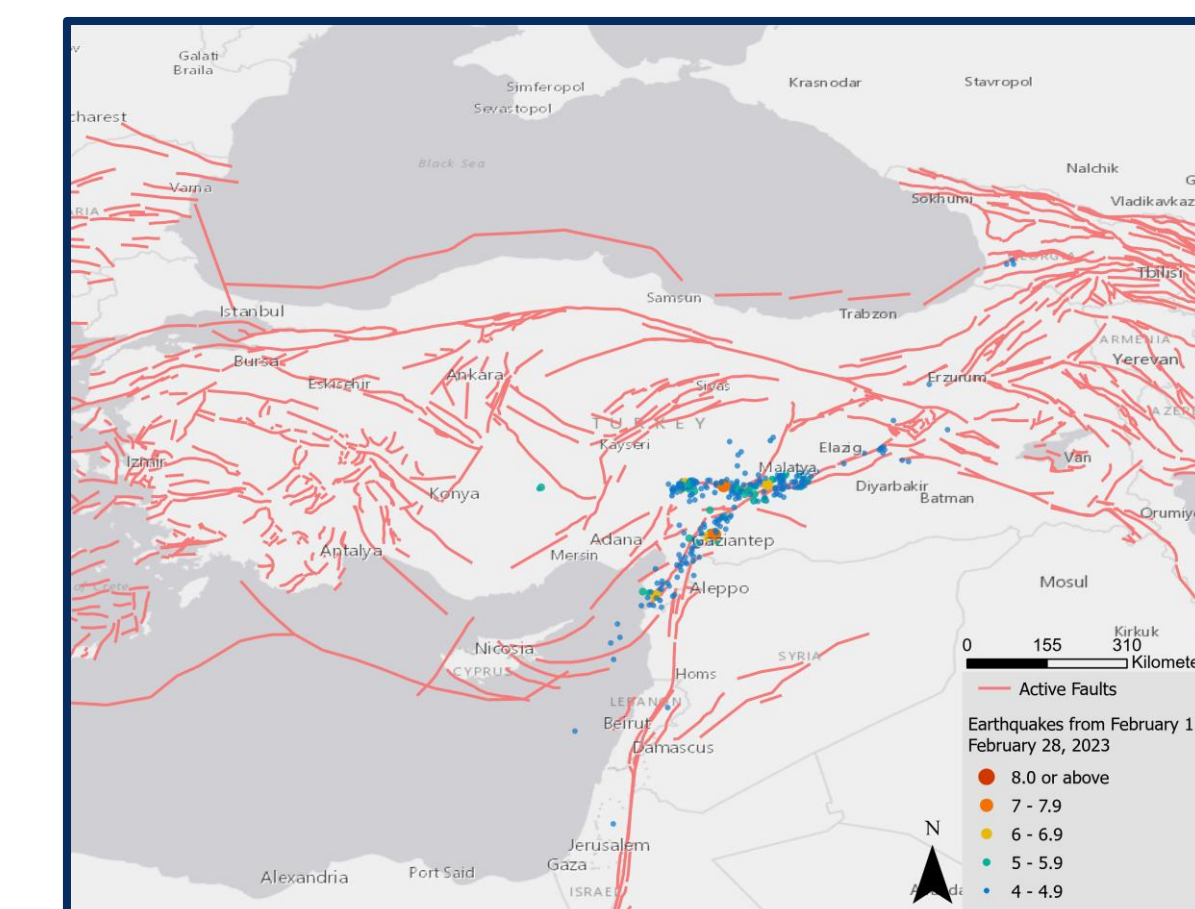
The NASA Disasters Mapping Portal contains event-based and near-real time products, story maps, and dashboards (such as above) that help provide situational awareness before, during, and after a hazard.

BACKGROUND

The February 2023 Türkiye/Syria Earthquakes are an example of how the NASA Disasters Program team supported a variety of stakeholders during a disaster response. In addition to the mass damage that occurred due to the ground movement itself, this event also caused cascading hazards, such as landslides, to occur. The NASA Disasters Program received requests for support from a variety of stakeholders, which led to the activation of the team. We were able to provide multiple relevant products to our stakeholders, supporting their response. This poster reviews the disaster life cycle through the lens of the NASA Disasters Program, highlighting key aspects of the coordination with stakeholders and how Earth observation data can aid in situational awareness during disaster response.

Türkiye/Syria Earthquake Overview

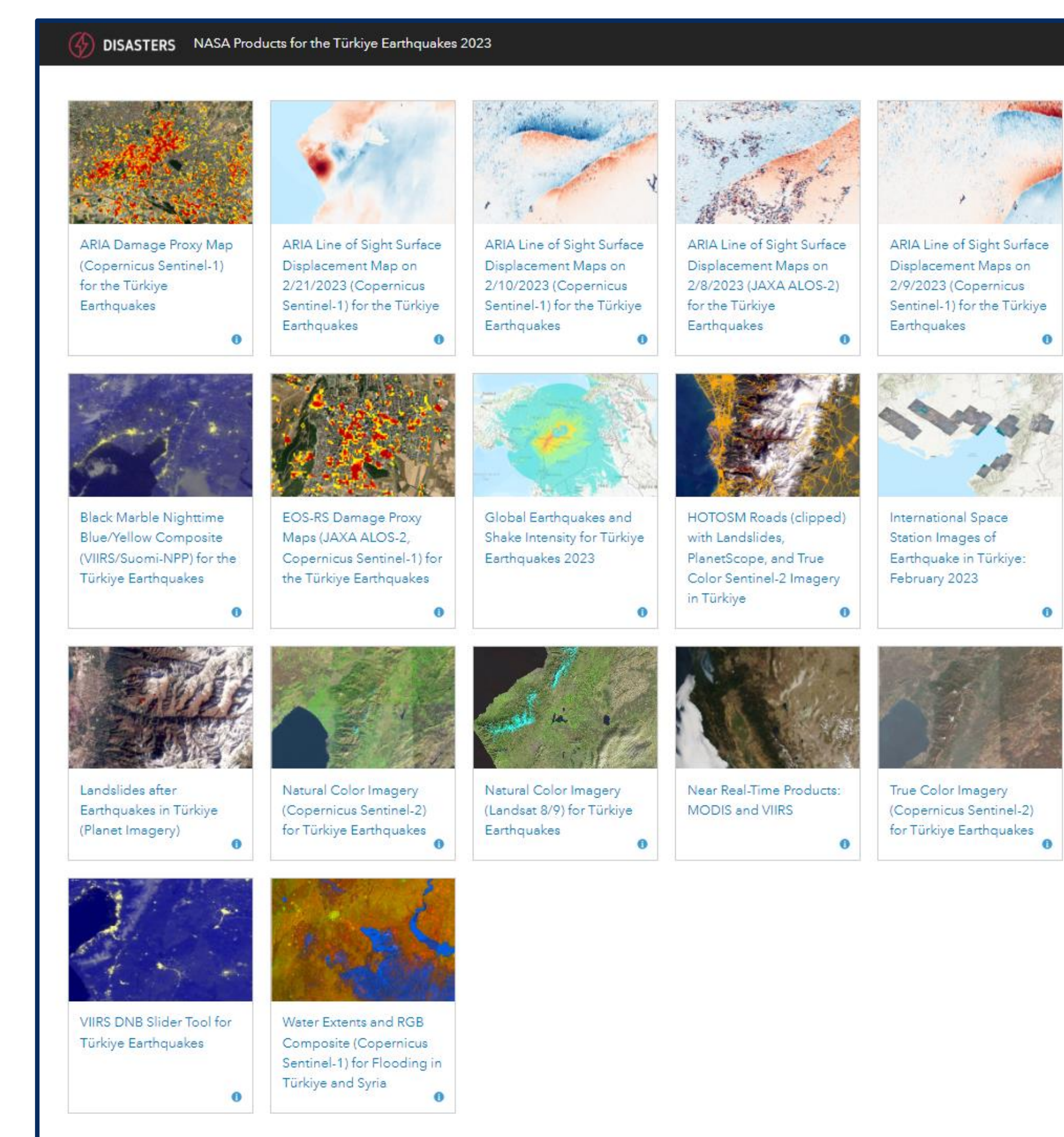
- ❖ Magnitude 7.8 earthquake struck near the Türkiye-Syria border on the morning of February 6, 2023.
- ❖ The M7.8 earthquake and hundreds of aftershocks (including a magnitude 7.5), caused over 50,000 casualties and widespread devastation.
- ❖ Hundreds of thousands of homes and buildings collapsed.
- ❖ Extreme winter conditions were present during the time of the event.
- ❖ The World Bank estimated \$34.2 billion of damage in Türkiye, and \$5.1 billion in Syria.



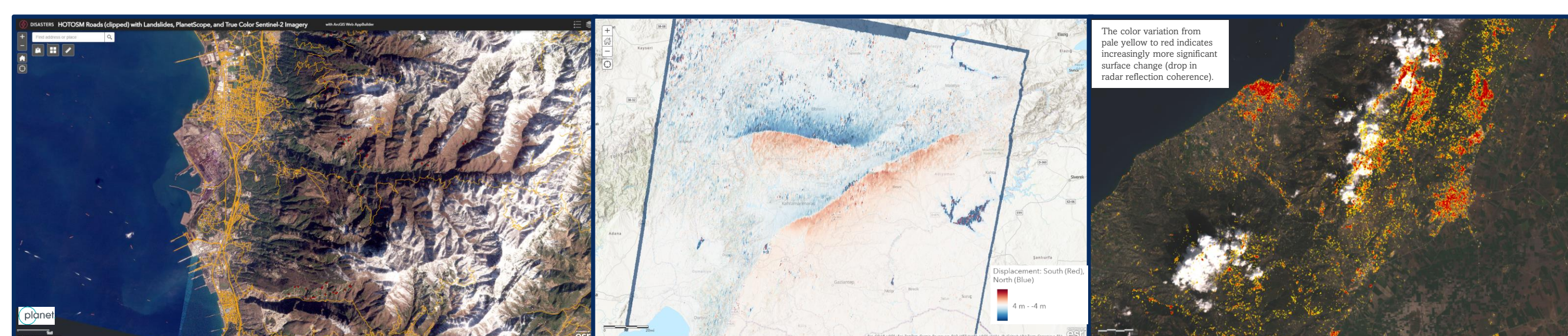
Active fault lines across western Asia, along with earthquakes symbolized by magnitude, for the month of February 2023.

NASA Disasters Program's Response Summary

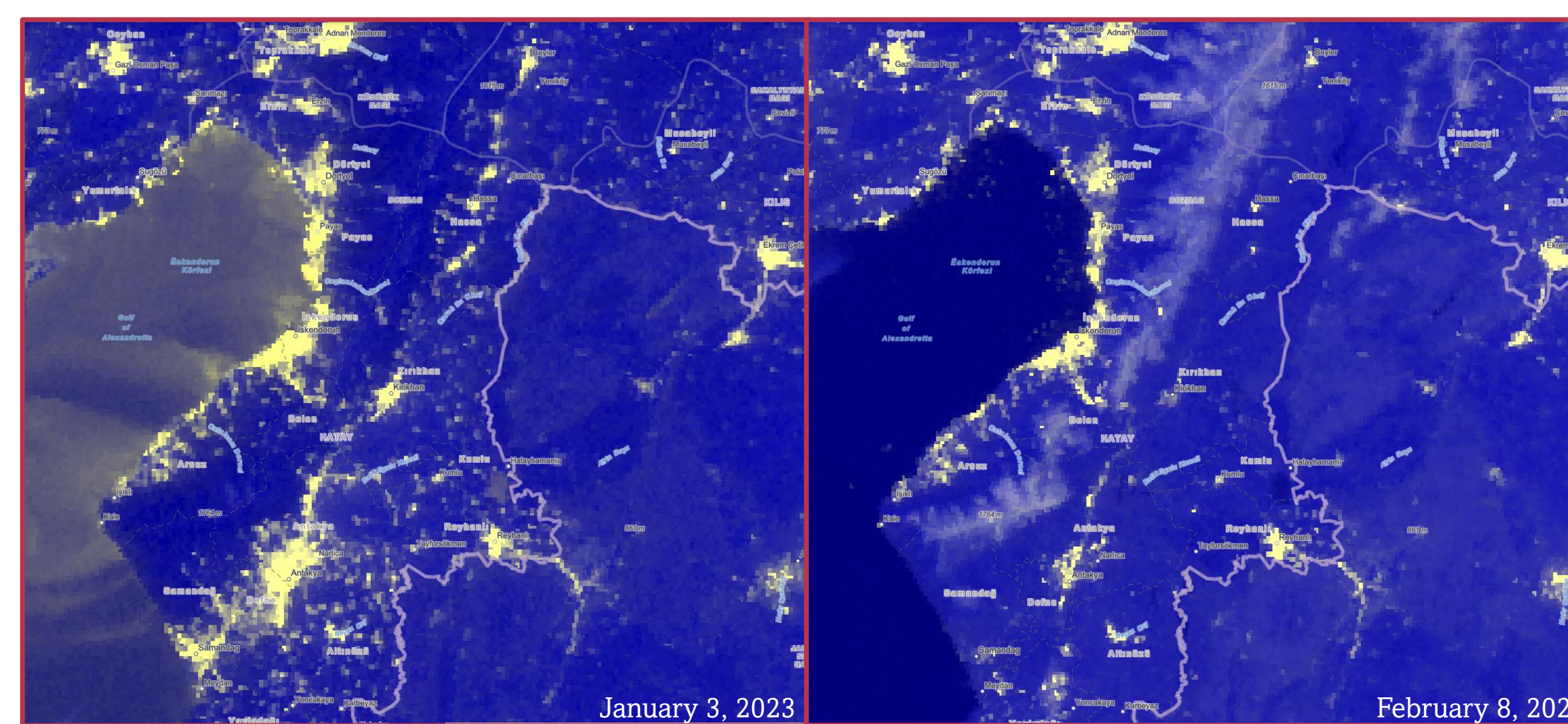
- ❖ NASA supported stakeholders including U.S. Agency for International Development (USAID), U.S. State Department, United States Geological Survey (USGS), National Institute of Standards and Technology (NIST), Esri Disaster Program, California Seismic Safety Commission, the World Central Kitchen, and Miyamoto Global Disaster Relief.
- ❖ Shared damage proxy maps with our stakeholders to assess extent of damage.
- ❖ Shared surface displacement maps with USGS to assess geological conditions and risk of further aftershocks
- ❖ In discussion with World Central Kitchen, mapped landslides were overlaid with roads and imagery to support their humanitarian relief efforts.



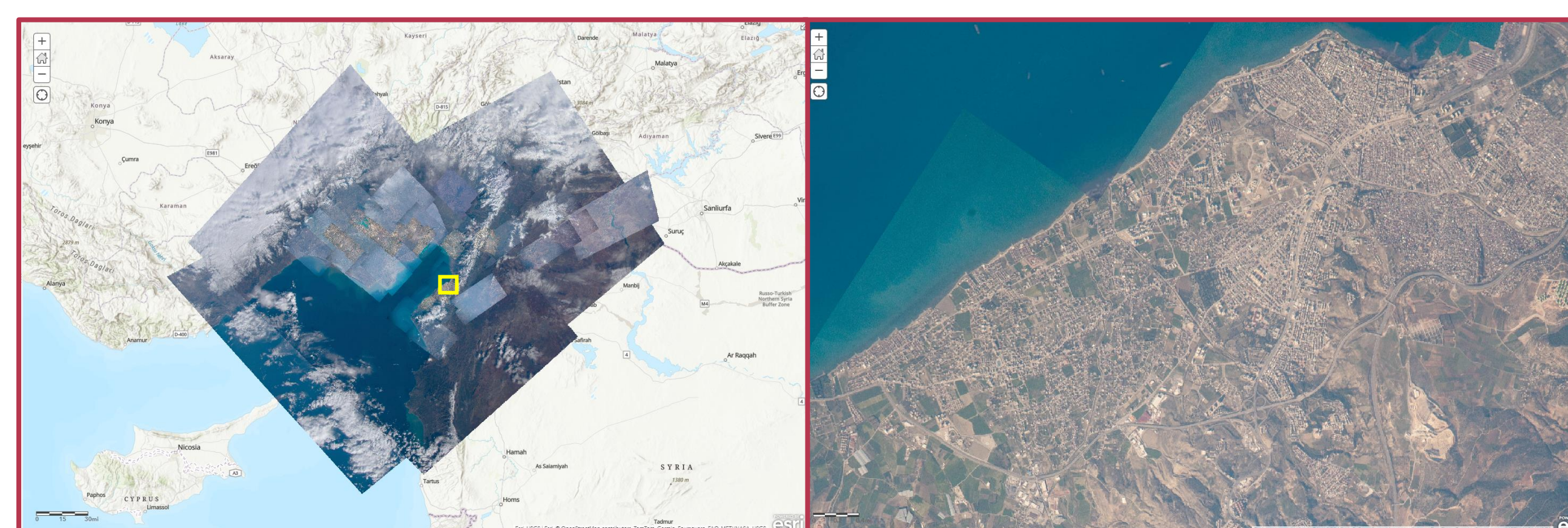
The NASA Disasters Program product gallery for the Türkiye/Syria Earthquakes in February 2023 that is hosted within the Disasters Mapping Portal. This product gallery contains all the "event-based" products that subject matter experts across the NASA centers create for responses. In addition, it contains a page for the near-real time products hosted on the Disasters Mapping Portal that could aid in response for this event.



The leftmost image displays the web application created to display landslides mapped by the Goddard Space Flight Center (GSFC) Landslide team overlaid with Humanitarian Open Street Maps (HOTOSM) roads, PlanetScope Imagery (8-meters), and Copernicus Sentinel-2 True Color Imagery (10-meters). The middle image displays surface displacement created using Copernicus Sentinel-1 Synthetic Aperture Radar (SAR) by the Advanced Rapid Imaging and Analysis (ARIA) team at NASA's Jet Propulsion Laboratory (JPL) and California Institute of Technology. The rightmost image displays a Damage Proxy Map (DPM) created using Copernicus Sentinel-1 Synthetic Aperture Radar (SAR) by the ARIA team at JPL and the California Institute of Technology.



These images display the false color band combination of data collected by the VIIRS instrument on the joint NASA/NOAA Suomi-NPP satellite from before (January 3, 2023) and after (February 8, 2023) the earthquakes. The imagery is most useful for identify nighttime lights from cities. This product is ~500 meters resolution, and a near-real time product (updated daily).



The image on the left displays the entire extent of visible-wavelength true color RGB digital camera (Nikon D5 Electronic Still Camera) images taken by astronauts on board the International Space Station (ISS) on February 8 and February 14, 2023. The yellow inset box on the left is showing the region within the rightmost box. The rightmost box is showing a zoomed-in portion of the region within Türkiye.

GET INVOLVED

The DRCS is request driven. Requests can come from disaster response organizations in:

- State, local, Tribal, or federal government entities
- Non-profit organizations working at the national scale
- International governments
- Organizations focused on emergency management and/or disaster response.

Requests should be sent by email to DRCS@nasa.gov.

Join the Disasters Program newsletter to keep up to date with the DRCS. We welcome opportunities to connect and engage.

Contact DRCS at DRCS@nasa.gov