Earth Observation data in emergency preparedness

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Number of these still active in space: about 5,000
What Earth Observation is

**EO provides:**
- **accurate** geo-locations for contiguous target areas;
- **objective**, consistent measurements of physical properties of the Earth and its atmosphere that can be interpreted to define its features and condition;
- **repeated** coverage to enable detection of changes in features and/or their condition.
Landsat programme

- Landsat (1972 -): spatial resolution: 15-100m
- temporal resolution: 16 days

Terra – Aqua satellites

- Spatial resolution: 250 m, 500m, 1 km
- Temporal resolution: 1-2 days
Copernicus programme

- Spatial resolution: 10 m, 20 m, 60 m (S-2)
- Temporal resolution: 5 days
Climatic and Environmental variables in vector-borne diseases

West Nile virus circulation and EO data

An Early Warning System

- Land Surface Temperature Day (Modis)
- Land Surface Temperature Night (Modis)
- Normalised Difference Vegetation Index (Modis)
- Surface Soil Moisture (Copernicus)

features extraction from EO dataset

ML model (XGBoost)

Pseudo negative sites

Ground truth
WNV circulation (2017-2020)

23 - from December 18 to December 31

Candeloro et al, Remote Sens. 2020, 12, 3064; doi:10.3390/rs12183064

web application: https://mapserver.izs.it/gis_wn_predictions/#
ECOREGIONALIZATION and vector-borne disease

Is the process through which a territory is classified into similar areas according to specific environmental and climatic factors (e.g., elevation, vegetation, rainfall, temperature)

Defining Ecoregions and Prototyping on EO-based Vector-borne Disease Surveillance System for North Africa - PROVNA project WOAH

Supporting the local competent authorities in North Africa (Mauritania, Morocco, Algeria, Tunisia, Libya and Egypt) in the identification of specific areas on which to carry out entomological/serological surveillance for vector-borne diseases. The disease selected for the first application is Rift Valley Fever.

1. Define ecoregions: similar areas with similar climatic and environmental characteristics
2. To build a customised prototype application (PROVNA) to show areas at risk for RVF in North Africa through a Machine Learning algorithm
Earth Observation data in emergency preparedness

- Multidisciplinary approach
- Collaborate
- Share

- Computer science
- Engineering
- Statistics
- Spatial science
- Domain expertise
Thank you

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