THE EXPERIENCE OF A COPERNICUS RELAY INDUSTRY WORKING IN EMERGENCY AND DISASTER

Antonio Tabasco Cabezas (atabasco@gmv.com)
www.gmv.com

EXPERIENCES IN EMERGENCY AND DISASTER

EMERGENCY MANAGEMENT

Useful use cases

- Prevention and Mitigation – Risk assessment
- Preparedness – Planning, Early warning
- Response – Mapping, Monitoring and Damage assessment
- Recovery – Assessment, Monitoring

Major users can include civil protection and relief authorities, humanitarian aid actors and others involved in recovery, risk reduction and preparedness activities
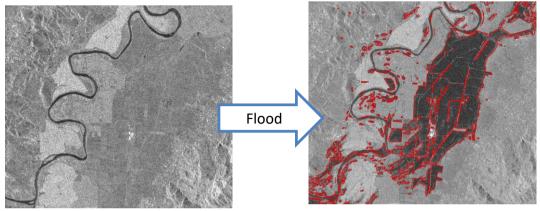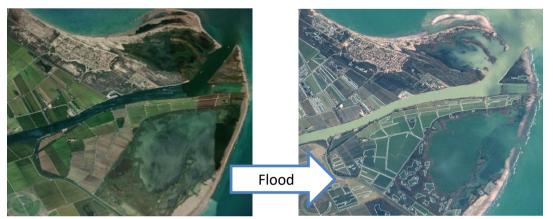
RESPONSE

Examples: Rapid mapping of Floods

Delineation of flood events

Using SAR or optical data to identify and extract the extension of a flood event.

SAR image T0

Flood →

SAR image T1

Optical image T0

Flood →

Optical image T1

RESPONSE

Examples: Rapid mapping of Floods

Damage assessment map

Using photointerpretation keys to assess the level of damage suffered by different infrastructures (e.g., road, buildings, bridges) during the flood event.
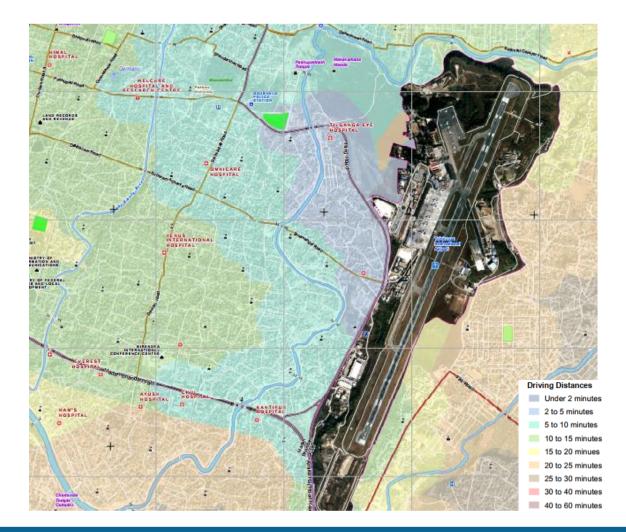
Flood damage assessment example

PREPARDENESS

Examples: Calculating driving time to reach the Airport, based on the road network travel time.

Estimation drive time to reach a specific facility

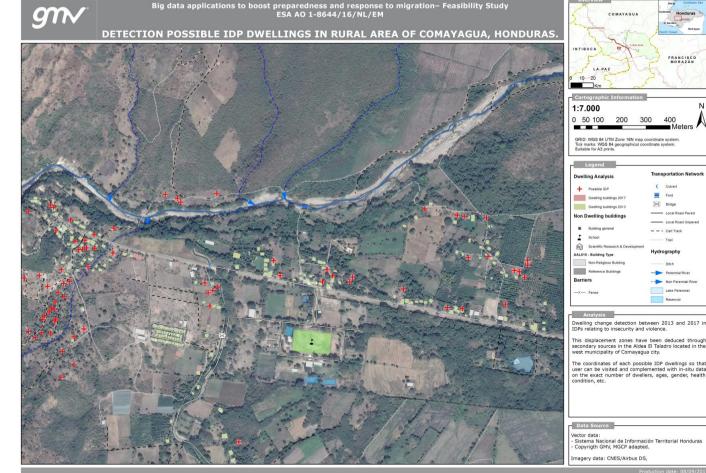Geographic Location of the health facilities and theirs capabilities

PREVENTION AND MITIGATION

Examples: Humanitarian Aid

To identify and map the evidences and the impact of migration over larger ground areas, usually in the order of thousands of square kilometers
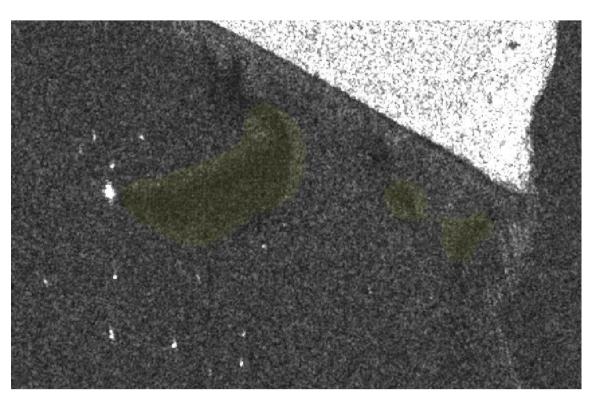
NEW TRENDS

NEW TRENDS – USE OF MACHINE LEARNING

Detection and Segmentation of Possible Oil-Spills in Marine Environment

A Deep-learning network aiming to solve   detection and segmentation of small-scale oil-spill based on radar images

Applied from results on medical image segmentation

Oil Spill, Niger delta , 2019

NEW TRENDS – INCREASE CLIMATE RESILIENCE

Devise evidence-based policies and plans that improve the resilience to current and future risks.

Why?

- Pressure on land and water resources
- Higher rates of land degradation / changes in land use
- Loss of biodiversity
- Under-provision of waste management and treatment (resulting in pollution)
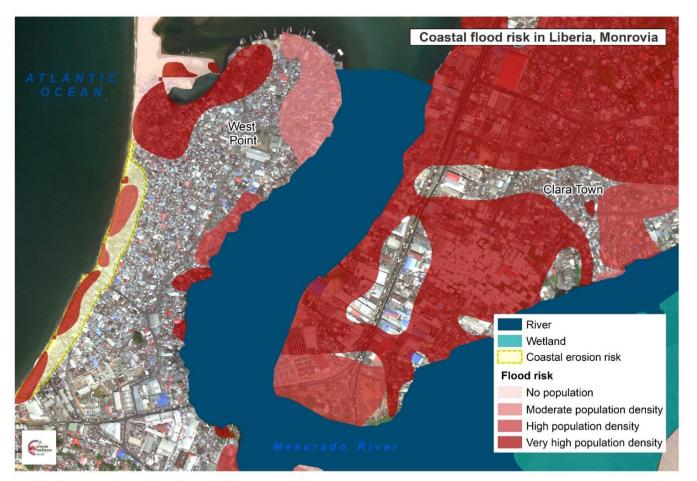
SUPPORTING CLIMATE RESILIENCE: MONROVIA

Model the impacts of climate change on the coastal parts where most human settlements, economic activity, infrastructure and public services are.

Services:

- Shoreline erosion monitoring

- Coastal flooding risk mapping

- Critical Infrastructure and settlement analysis
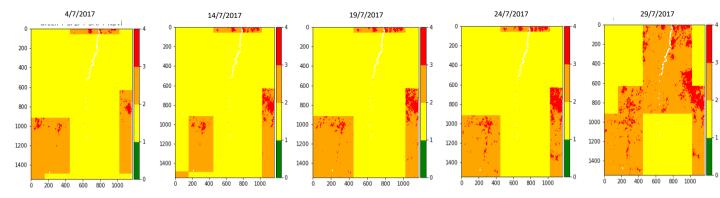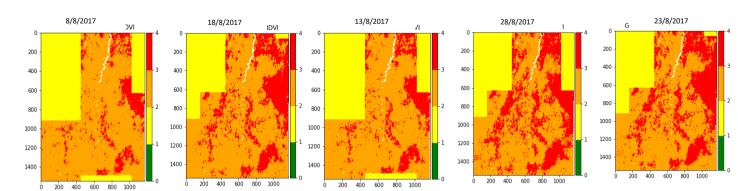

Coastal flood risk in Liberia, Monrovia

SUPPORTING CLIMATE RESILIENCE: SOMALIA

Using an EO-based Agricultural Drought Indicator (ADI) to monitor the Agricultural Drought in Somalia

Facts:

- Drought in 2016 had left, 40% of Somalia's population food insecure

- More than 800,000 people fled their homes in search of water and livelihoods

NEW TRENDS – INTEGRATION OF DIFFERENT SOURCES

Very high quality information is already available, no need to re-invent the wheel

Focus on the fusion of the information and in downscaling to go regional or local

The examples presented make use of:

- Global Human Settlement layer
- ESA climate change initiative
- ESA Urban TEP's World Settlement Footprint
- Open Street Map
- Copernicus satellites
- VHR commercial imagery

CONCLUSIONS

- Emergency and Disaster events are unfortunately growing in number and duration

- There is a clear need for developing quality long term monitoring solutions that improve the resilience to current and future risks

- Europe has become one of the largest providers of quality and reliable information thanks to Copernicus, but information needs to be integrated and squeezed to be provided at the proper scale

- The extension and duration of the crisis together with the amount of information available require new approaches to the processing of data

- Industrial and Research worlds need to tighten the collaboration to be able to deal with demanding requirements

QUALIFICATION

GMV is active in the following activities related to the topic of this webinar:

- ESA EO4SD - Climate Resilience Cluster project
- Copernicus Emergency Management Service
- Copernicus services in Support to EU External Action
- ESA Big Data for Migration

For more information please refer to www.gmv.com or reach me at atabasco@gmv.com