EASOS
EARTH AND SEA
OBSERVATION SYSTEM

EASOS Flood Watch In Action

On 22nd November 2017, EASOS Flood Watch predicted that flooding would occur within the regions of Pasir Mas, Tanah Merah and Machang in Peninsula Malaysia on 26th November at 18:20.

This information was made available to the Malaysia government who combined this with data that they held on available resources and used it to help manage their response to the Kelantan flooding.

The flood predictions allowed Malaysian authorities to prioritise resources to the areas predicted to flood. They used EASOS Flood Watch and feedback concluded that EASOS services were game changers and provided opportunities to generate new capabilities to complement government disaster management and response.

EASOS Flood Watch is a state-of-the-art application capable of defining areas of a country at risk of flooding. Flood Watch generates alerts, forecasts flooding up to 7 days in advance, produces actionable information about impacted areas and allows for more targeted operations by emergency planners.

EASOS Flood Watch helps to improve the overall awareness of flood risks. It enables authorities to activate relevant evacuation plans and to consider short-term flood defences. Ultimately, by providing advanced decision support, this enables a reduction in the number of fatalities, damage to personal property, businesses and infrastructure.

The design of Flood Watch allows the extraction of maximum intelligence from flood risk and prediction information to create a powerful decision support capability. Whether implemented for planning, exercise management, pre-emptive action, or crisis management; the application offers huge value to those responsible for flood management.

easos.org.uk

EASOS Flood Watch Engine

EASOS hydrological flood tools are built on tried and tested technology and used by multiple large insurance companies to better estimate flood risk on a per building basis. Having developed the tool based on quality and sensitivity, it is now used for property risk assessment throughout the UK and internationally.

EASOS Flood Watch enables:

- **Flood Forecasting** up to 7 days in advance
- **Flood Hazard** and **Risk Modelling**
- **Advanced decision support**

Flood Watch

Flood Forecasting

EASOS Flood Watch can automatically generate 4 flood forecasts every day. The movement of water is modelled taking into consideration land use, vegetation coverage, topology, and other available data. The application utilises a gridded model of river and surface water flows including areas of inundation. Live impact forecasting predicts flooding where there is too much water to be absorbed or drained. Flood impact mapping is used to predict the depth, duration, and extent of flooding using highly accurate modelling techniques. This enables a wide range of possibilities for localised disaster risk management, allowing information at street level precision. Flood Forecasting allows:

- Flood forecasting up to 7 days in advance allowing contingency planning

- Detailed mapping of areas at risk of flooding updated every 6 hours as new information is received

- Ability to predict areas of flooding risk at 100M resolution or better

- Integration to allow ordering of relevant satellite imagery

- Understanding of the financial and human impact of flooding
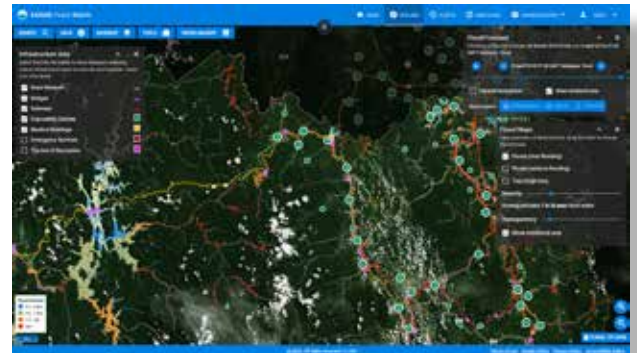
Advanced decision support

- Continuously (24/7) monitor river and rain gauge state to allow real-time monitoring of flood development
- Forecast the impact of rain
- Conduct impact mapping and analysis prior to an event
- Users receive alerts tailored to their specific needs
- Identify specific impacts to infrastructure such as road networks and bridges
- Identify suitable escape routes and safe havens
- Receive information on the likely start, duration and intensity of flooding
- Visualise flood predictions in a simple user interface to support rapid decision making
- Use flood scenarios to conduct flood training exercises
- Identify areas of high statistical likelihood of flood for planning, analysis and mitigation management

Flood Hazard and Risk Modelling

EASOS Flood Watch models all major flooding mechanisms - Fluvial (river), Pluvial (surface water) and Tidal (coastal). This analysis is used in the following ways:

Hazard Maps provide static analysis maps showing 1 in 5, 20, 100, 1,000 and 10,000-year scenarios for each flood mechanism. These maps are used to interpret potential flood extents and depths across each region allowing a range of scenarios to be visualised by increasing or decreasing the severity of the event.

Exposure Maps show the relative exposure based on the population living in each area to better understand the impact of predicted flooding.

Risk Maps show the total population at risk of flooding by single or multiple flood mechanisms. This allows analysis of the relative flood risk considering probability and the impact on the population.

SPECIFICATIONS SUMMARY		
DATA	• Digital terrain data combined with a hydrological model for flood forecasting • Weather forecast, weather radar, river and rain gauge telemetry received up to every 15 minutes to provide accurate on-the-ground information	• Weather forecasts, NowCast data, Rainfall Radar, High quality Digital Terrain Modelling, land use, and soil depths to predict where water will move over the coming days
VISUALISATION	• Detailed flood forecast and location are shown down to street level for up to the next 7 days • Provides a common understanding across multiple government departments and easy communication of flood warning • Flood impact mapping and analysis throughout flooding events	• The intuitive user interface to assist with decision making for non-technical stakeholders • Shows hazards and potential impacts to key infrastructure such as road networks, bridges, schools and hospitals etc • Monitoring of whole river catchments to see effects of rainfall as it moves through the system
ALERT	• Tailored alerts to specific user needs, areas of interest and risk awareness	• Advanced warning of flash floods
ACTION	• Mobilise relevant response authorities • Identify low-risk areas for potential evacuation points	• Direct limited resources to those key areas that will be most impacted

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