

1.1 INTRODUCTION



IES and HYDS have implemented a high-quality Weather Forecasting and Multi-Hazard Early Warning System in the Kingdom of Tonga under a World Bank Project. Thanks to the Tonga Project authorities and staff assigned on this project, it has been developed with constant input from the client which we greatly admire. It meets the client's requirements and works as expected. The system consists of Met-WebGIS, and WAFS-WebGIS (Aviation related part), both IES products, and ARGOS, an HYDS product.

IES Met-WebGIS has been developed over a period of many years, always bringing in improvements and new functionality required by various clients. It was fully tested by the Meteorological Service of Canada (**MSC**), and they made suggestions which were implemented. Argos was developed by **HYDS** as a part of the European System called **A4EU** (Anywhere for Europe) or simply Anywhere. It was later branded as Argos which is fully based on A4EU.

1.2 ARGOS, FROM RESEARCH TO THE OPERATIONAL CONTEXT

As already stated, **Argos** has been developed using cutting-edge technology to enhance the **risk management** of emergencies derived from **weather-induced** events. **Argos's** technology provides solutions at all key levels: continental, national and regional scale. Currently **Argos** is implemented at national and regional levels in several countries in Europe.

The Argos platform is designed to develop operational solutions through an interconnected system of a Central Node and National Node(s). This approach facilitates the dissemination of extensive information and alerts regarding weather-induced hazards, while also offering highly detailed local data, including warnings, impacts, and protocols, all within a cohesive solution.

1.3 CENTRAL NODE FOR EUROPE

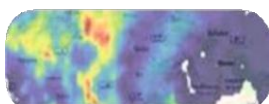
This implementation connects and collects data and warnings in real time from global platforms (Copernicus, NASA, etc.) and national agencies (National Weather Agency, National Geological Institute, National Water Directorate, National Transit Authority, National Ports Authority, etc.) to provide a single access point to all Continental warnings and associated information for civil protection authorities.

1.4 NATIONAL NODE

This implementation aims to deliver early warnings regarding various components, including both administrative units and critical elements. Its purpose is to assist civil protection authorities in focusing their efforts on the most vulnerable areas, disseminating localized warnings, and allocating resources effectively. By integrating multiple sources of impact products with auto-protection plans, this system enables civil protection authorities to initiate impact mitigation measures and enhance overall emergency management.

1.5 INTEGRATING THE KEY ASPECTS

Argos consolidates all necessary processes for managing weather-related hazards, integrating data, products, warnings, impacts, and protocols into a cohesive solution.



Hydrometeorological forecast



Early-warning detection



Exposure & Vulnerability



Impact Forecast



Management Protocols



Dissemination

2 MULTI-HAZARD SOLUTION

Droughts, floods, forest fires, air pollution, heat/cold waves, snow falls, etc., it does not matter, our solution covers everything: adapted to your region, specifically to your situation.



2.1 FOSTERING THE PROACTIVE MANAGEMENT

Remain consistently one step ahead. With early warning forecasts available days in advance and high-resolution impact models for specific assets accessible just hours prior, Argos empowers you to transition from reactive to proactive management.

2.2 EVOLVING WITH NEW REQUIREMENTS

Argos is constructed upon an open architecture, which enables you to enhance your management processes by integrating new products and alerts, expanding your critical points, redefining protocols, and improving dissemination, among various other enhancements.

2.3 CONNECTING OPERATIONAL AUTHORITIES

Whether-induced hazard management is a matter of connecting different operational authorities. Argos and its family of products (Argos City, Argos Site) enable the seamless harmonization of city management processes at various scales: continental, national, regional, and local.

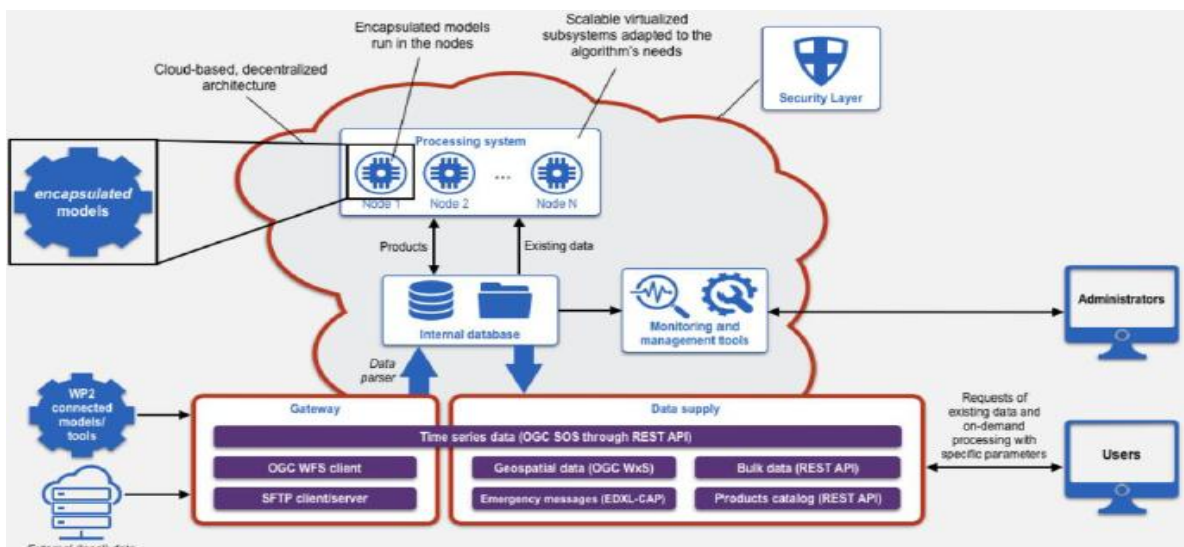
2.4 COLLABORATIVE APPROACH

From emergency calls to traffic cameras and social networks, Argos has been meticulously designed to seamlessly integrate various information sources essential for effective operational management. Moreover, these new data streams can help establish innovative guidelines for your decision-making processes regarding warnings.



2.5 MOST COMPREHENSIVE SOLUTION

Argos service architecture follows a modular approach allowing for integration of data, models, products, warnings from any incorporated information, external sources, protocols, etc.



2.6 Argos global solution

Off the shelf solution with global information to provide complete service with a minimum set up. Argos also allows for an easy adaptation including additional local information (models, sensors networks, critical information, protocols, etc.).

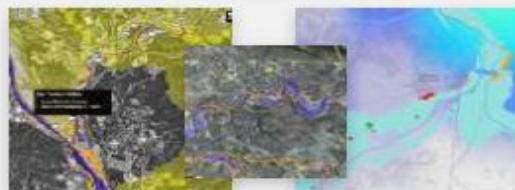
Global platforms

- GLOFAS (Global Flood Awareness System)
- GDO (Global Drought Observatory)
- GWIS (Global Wildfire Information System)
- NASA and others...



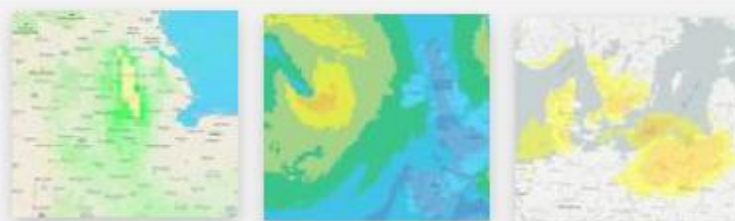
Satellite

- GPM (Global Precipitation Measurement)
- NASA Earth Observatory
- SENTINEL Copernicus



NWP

- GFS
- ECMWF
- Local models



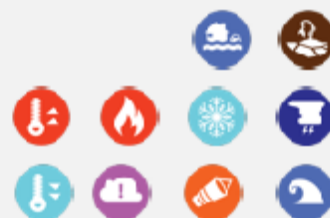
National data and systems

- Weather Radar
- AWS
- Environmental sensors



Algorithms

- | | | |
|----------------|----------------|---------------|
| • Flash-floods | • Droughts | • Snow |
| • Floods | • Storm surges | • Air quality |
| • Forest Fires | • Heat waves | • Wind |



Data - impact

- | | |
|-----------------|---------------------|
| • 112 / 911 | • Critical elements |
| • Transit | • Infrastructure |
| • Crowdsourcing | • ... |



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