



# Waste Earth Observation Services

WEOS is helping authorities in rapid response mapping and long term monitoring of illegal waste treatment sites.

There is growing worldwide concern regarding the trans-frontier shipment of hazardous and other waste within the western economy itself and between western economies and developing countries.

In short there is a major awakening to the potential risks of waste shipment. The risk associated with the international transshipment of waste includes the following:

- Terrorism and state sponsored terrorism
- The illegal trafficking of arms

- The illegal trafficking of dual use technology
- Drug trafficking
- Human trafficking
- Environmental pollution
- Health and safety risks

Yet there is no quantifiable information or statistics that inform us how much waste is transhipped out of the EU or North America each year, or what types of waste are being trans-shipped and to where.

WEOS (Waste Earth Observation Services) project, financed by ESA (European Space Agency), looks

at the area of waste management with the aim to extend the uptake of the Earth Observation (EO) based geo-information services already tested and demonstrated in previous projects.

The proposed WEOS services will follow a further customisation of the already existing WASTEMON services, using Optical and Radar EO data, in order to respond to the different needs of the European user community involved into law enforcement and intelligence fields of action. Among the International users (i.e. EEA) and stakeholders (i.e. World Bank), the project will

see the active involvement of international law enforcement user organization (i.e. INTERPOL). A Consortium led by ERA Maptec involving Planetek Hellas and GAMMA Remote Sensing will tap into a wider market scope with the customization of new services strongly based on: a) algorithms used on other domains (e.g., subsidence, vessel detection, object-oriented classification); b) the capacity to acquire and process satellite data faster in response to users involved with law enforcement. Within this context, the project will spend a strong effort on the legal aspects analysis in order to define the services for their admissibility also for legal purposes and to ensure their trustworthiness in judicial proceedings.

The following two services are proposed:

- Service 1 Rapid response mapping of illegal waste treatment sites
- Service 2 Long term monitoring of illegal waste treatment sites

The WEOS services follows a workflow based on a semi-automated process, which combines the advantages of automated classification procedures with the high precision of visual interpretation.

The “Rapid response” service aims to provide information on

current events by creating a map of the areas where the waste sites are located. The sites are labelled according to different levels of classification probability. In this context, the classification probability represents a sort of indicator used to assign the priority of intervention: sites with high level of reliability identify the areas where most likely the priority of intervention is highest. The “long term monitoring”, aims to provide intelligence gathering to support on the ground agencies. It will provide an extra layer of intelligence, which is complimentary to existing methods.

Examples of application of such services are the cases of mapping containers of waste, waste sorting and disposal areas, ship dismantling, environmental impact of illegal waste treatment sites, site extensions and evolution, etc. Providing a monitoring service of sites most likely suitable for illegal disposal of waste will help authorities in countries that receive waste, to cost effectively allocate resources on the ground to clamp down on illegal activities.

The Expected Outcomes of WEOS are:

- A customised product tailored to the users infrastructure, working protocol and technical capabilities

- A better understanding of existing and future trends in criminal activities associated with waste originating in Europe and beyond
- A better and faster support for environmental agencies’ judicial activities regarding illegal waste disposal detection and prosecution
- Prototype rapid and long term activation service for the mapping of criminal activities associated with waste

The benefits of such services and the derived products are numerous. Among others, WEOS can:

- Provide reliable and constant information on local, regional and national level, and also adhere to European Obligations and laws
- Address needs in a more cost benefit scenario in term of area coverage, target identification, rapid assessment and action taking
- Provide a rapid and reliable mechanism for criminal detection as well as fine issuing
- Be used for Land change detection data for use in Judicial situations (with coordinates, time frame and type of waste).

 **Project resources:**  
[www.planetek.it/eng/weos](http://www.planetek.it/eng/weos)

