



D3.2 EO applications information package and toolkit

IASON: Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas

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¹ **R** = Report, **P** = Prototype, **D** = Demonstrator, **O** = Other

² **PU** = Public, **PP** = Restricted to other programme participants (including the Commission Services), **RE** = Restricted to a group specified by the consortium (including the Commission Services), **CO** = Confidential, only for members of the consortium (including the Commission Services).

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ABBREVIATIONS

Term	Explanation
BS	Black Sea region
CA	Consortium Agreement
CB	Capacity Building
CIP	Common Information Platform
CSW	Catalogue Service for the Web
DB	Database
EC	European Commission
EC-GA	European Commission Grant Agreement
EC-PO	European Commission Project Officer
EO	Earth Observation
FP7	European Union Seventh Framework Programme
FPR	Final Project Report
GEO	Group on Earth Observation
GEOSS	Global Earth Observation System of Systems
GUI	Graphical User Interface
MED	Mediterranean region
MPP	Microsoft Power Point
PM	Project Manager
PNF	Permanent Networking Facility
PPR	Periodic Project Report
PR	Partner Representative
SoS	System of Systems
TL	Task Leader
WP	Work Package
WPL	Work Package Leader

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EXECUTIVE SUMMARY

This document describes the concept and the structure behind the IASON EO applications information package and toolkit. The goal of D3.2 is

- To develop an information package and toolkit with respect to EO applications and tools regarding coastal monitoring, water and soil resources management, and mining and mineral exploration, with respect to policy related results regarding the FP7 Environment Theme.
- To extend if possible the toolkit with other EO applications relevant to the identified regional and national needs with respect to the European EO Horizon 2020 Agenda.

Our scope is to provide users with an EO application information package and toolkit primarily focused in the three thematic pillars of IASON and extended in H2020 societal challenge 5 themes. Furthermore the EO application information package and toolkit will be extended to include information about GEO societal benefit areas (Agriculture, Biodiversity Climate, Disasters, Ecosystems, Energy, Health, Water, and Weather).

Currently a full EO applications information package and toolkit regarding agriculture has been implemented. Furthermore four more packages have been deployed presenting best cases regarding EO applications in the field of disasters, energy, biodiversity and water.

It must be underlined that the creation of the EO applications information package and toolkit will be an ongoing activity during the project's lifetime, where new material will be added the dedicated web site section by the consortium members and web site users, thus enriching the IASON Common Information Platform (CIP).

1. INTRODUCTION

According to IASON DOW deliverable D3.2 EO applications information package and toolkit has the goal:

- To develop an information package and toolkit with respect to EO applications and tools regarding coastal monitoring, water and soil resources management, and mining and mineral exploration, with respect to policy related results regarding the FP7 Environment Theme.
- To extend if possible the toolkit with other EO applications relevant to the identified regional and national needs with respect to the European EO Horizon 2020 Agenda.

Coastal management, water and soil resources and mining and mineral exploration are parts of the four more generic pillars of H2020 societal challenge 5 (Climate action, environment, resource efficiency and raw materials). Our scope is to provide users with an EO application information package and toolkit primarily focused in the three thematic pillars of IASON and extended in H2020 societal challenge 5 themes. Furthermore the EO application information package and toolkit will be extended to include information about GEO societal benefit areas (Agriculture, Biodiversity Climate, Disasters, Ecosystems, Energy, Health, Water, and Weather).

2. THE EO APPLICATION INFORMATION PACKAGE AND TOOLKIT CONCEPT

EO applications share a common ground in a lot of different scientific fields. In addition the four pillars of H2020 societal challenge 5 are overlapping and interconnected. The same principal applies to the three thematic areas (Coastal management, water and soil resources and mining and mineral exploration) that IASON is covering. The basic concept is to provide a one stop tool in the form of a Microsoft Power Point (MPP) Template that will cover both the information package aspect of EO application together with the EO toolkit. The MPP template will be accessible through the IASON website and it could be modified, downloaded, and extended. Furthermore the ability to upload new content, (in the form of a newly populated MPP file), will be presented to IASON web site users. The overlap of the different EO applications in the GEO societal benefit areas is demonstrated in Figure 1.

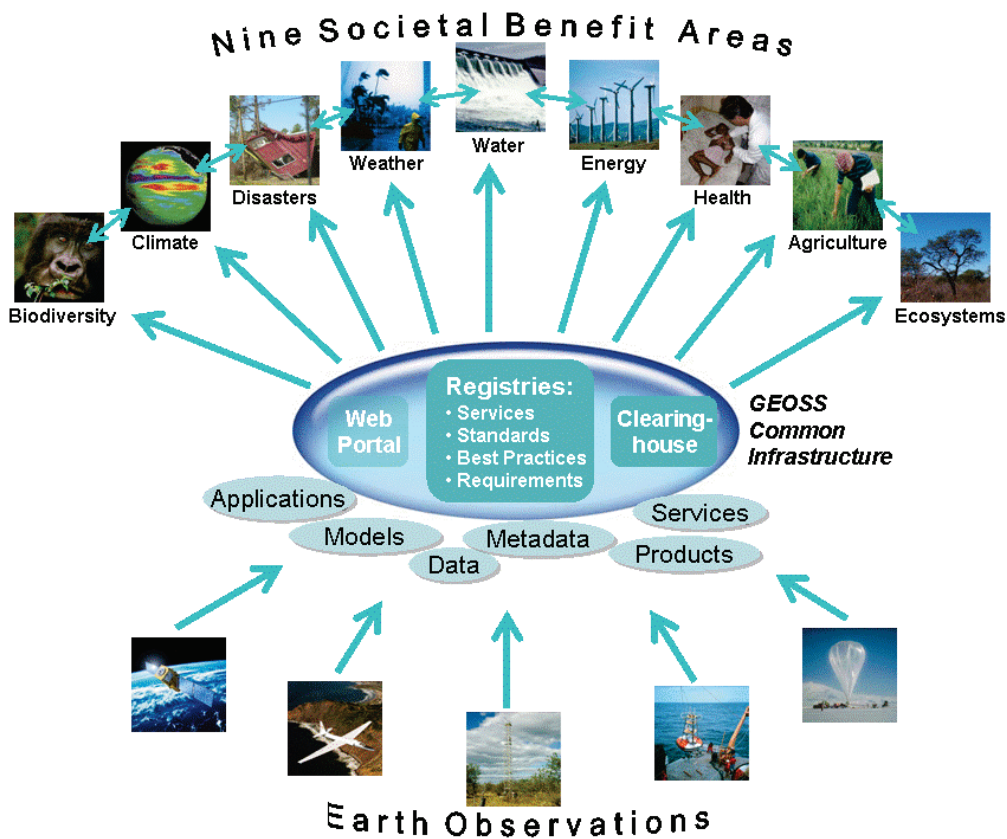


Figure 1 GEO Nine Societal Benefit Areas

It is evident that there are strong links among the nine societal benefit areas, both in terms of overlap between the scientific fields, and the EO applications that can be applied. EO data acquired from a sensor can be capitalized and used to produce results in different areas. The IASON EO toolkit aims revealing alternative uses of EO data to different applications. For example, Weather satellite data have the obvious use of weather prediction but they can also be used for fire detection and monitoring. As a result the IASON EO toolkit has the goal to be a reference point where users would acquire information regarding usage of EO data that connect the different scientific fields.

In order to achieve its goals IASON will continuously update and enrich its toolkit content and capitalize on the results of previous FP7 projects such as OBSERVE, GEONETCAB, BALKANGEONET, etc.

The IASON EO application information package and toolkit is portioned in two major components the web based component that will provide all the information and enhanced capabilities to the IASON web site user and the MPP template that will hold all the information and could be downloaded, modified, extended and uploaded.

2.1 The web Site tool Structure

The basic structure of the website section dedicated to the EO applications information package and toolkit is presented in Figure 2. Each MPP presentation will be assigned tags based on the application theme and also the region that examples / best practices included in the presentation are located. In the following Table 1 a sample of possible theme and location tags is presented.

Theme Tag (Keyword)	Location Tag
Climate Action	Mediterranean Region
Environment	Black Sea Region
Resource Efficiency	Balkan Region
Raw Materials	European
Coastal Management	International
Water and soil Resources	Danube Region
Mineral and Mining Exploration	
Agriculture	
Biodiversity	
Disasters	
Ecosystems	
Energy	
Health	
Water	
Weather	

Table 1 Theme and Location Tags

It is clear that certain toolkits will be part of more than one theme, and thus they can be retrieved from every website sub section. In addition, theme and location tags will be updated when new material is uploaded or modified in the section. Additionally, a dedicated menu and online application will allow the users to modify and extend online an MPP presentation, while a different form will allow them to upload new material and provide all the necessary tags.

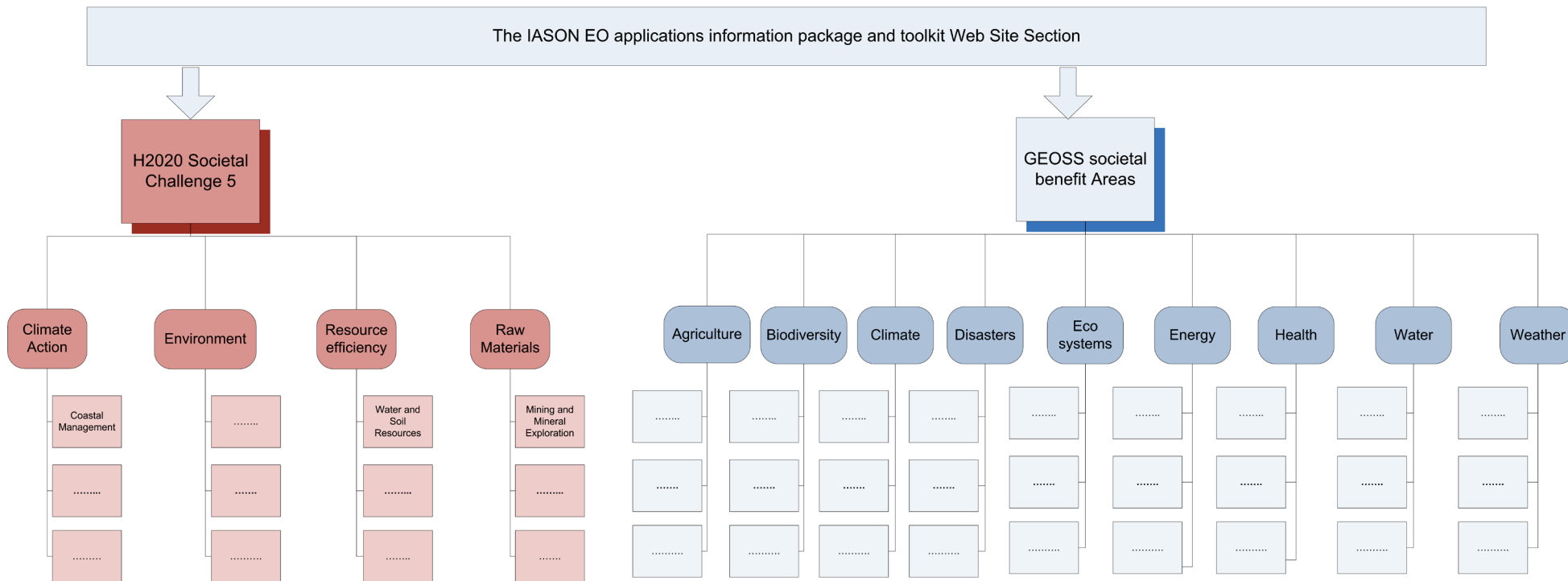


Figure 2 The IASON EO Applications information package and toolkit webpage section structure

2.2 The Microsoft Power Point Template structure

The MPP template is partitioned in two sections that include all the necessary material. The first section is dedicated to the EO application information package, while the second section is dedicated to the EO application toolkit. Figure 3 presents the structure of the MPP template.

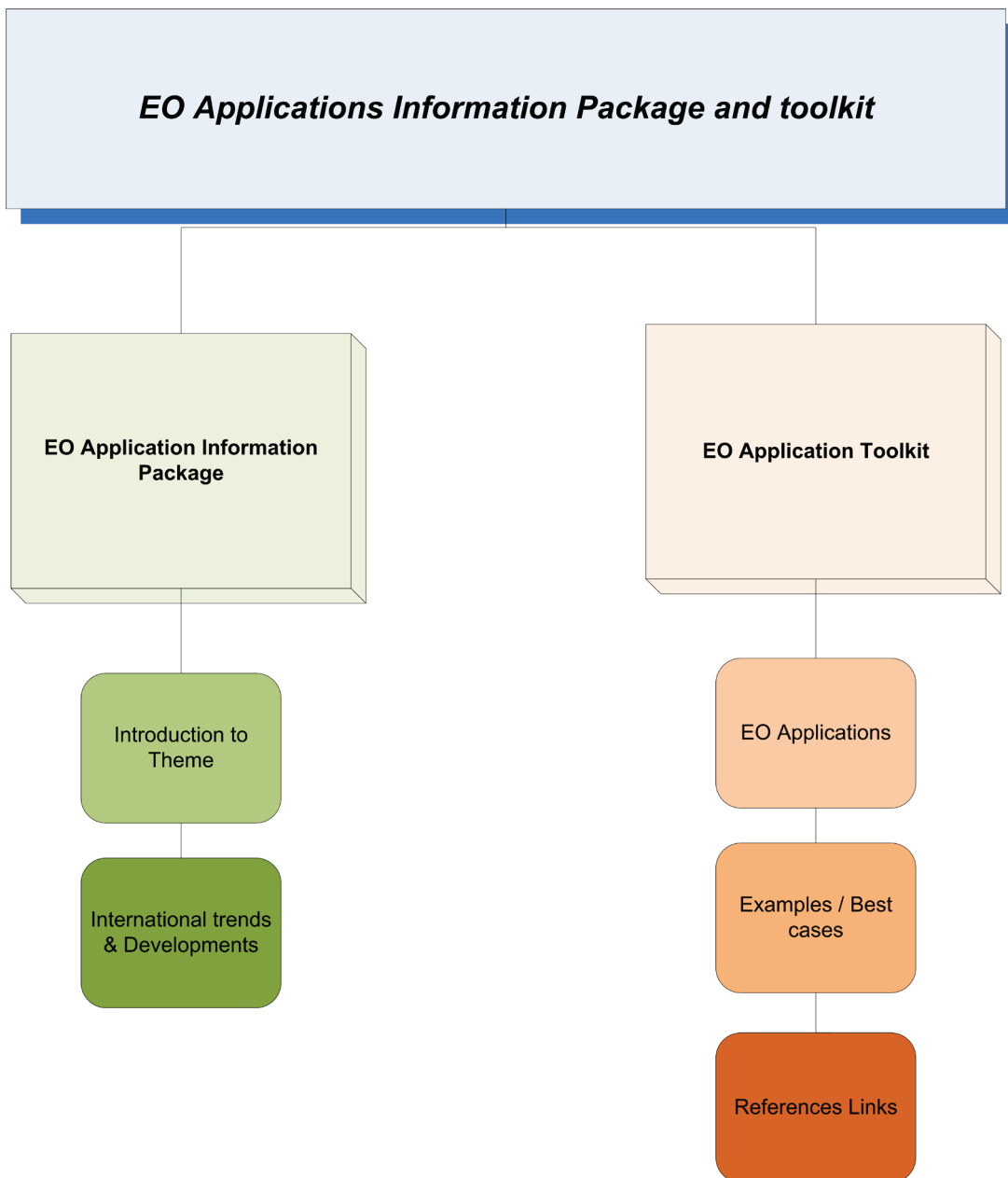








Figure 3 MPP template structure

In the initial page some general information regarding the toolkit author and the project that the information retrieved is presented.

The first section incorporates all the information regarding the specific EO application. More specifically, this section includes the introduction and definition of the theme, and the problem statement, along with relevant information about the international trends and developments in the specific scientific field by providing links and references to relevant material.

The second section focuses at the EO applications to the specific theme defined in the first section. A general overview of the EO applications in theme is presented and then a series of examples, best cases / best practices is demonstrated in detail along with links and references. Finally general references, links and further information is provided to the end user.

It must be noted that users will have the ability to upload addressed to only a subsection of the template i.e. just an example or a best case. In Figure 4 the IASON EO Applications Information package and toolkit is presented.

   <h2 style="text-align: center;">EO APPLICATION TITLE</h2> <p style="text-align: center;">Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas (IASON)</p> <p style="text-align: center;">Presenter name Organisation</p> <p style="text-align: center;"><small>IASON project is co-funded by the European Commission under the Grant Agreement 603534, Theme [ENV.2013.6.5-4 ENV.2013.6.5-4]</small></p> <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">1</p>	 <h2 style="text-align: center;">Content</h2> <ul style="list-style-type: none"> • Type the content of the toolkit • C 1 • C 2 * ... <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">2</p>
 <h2 style="text-align: center;">Introduction to Theme</h2> <ul style="list-style-type: none"> • This is for slide 1 * ... * ... <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">3</p>	 <h2 style="text-align: center;">Problem Statement</h2> <ul style="list-style-type: none"> • This is for slide 1 * ... * ... <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">4</p>

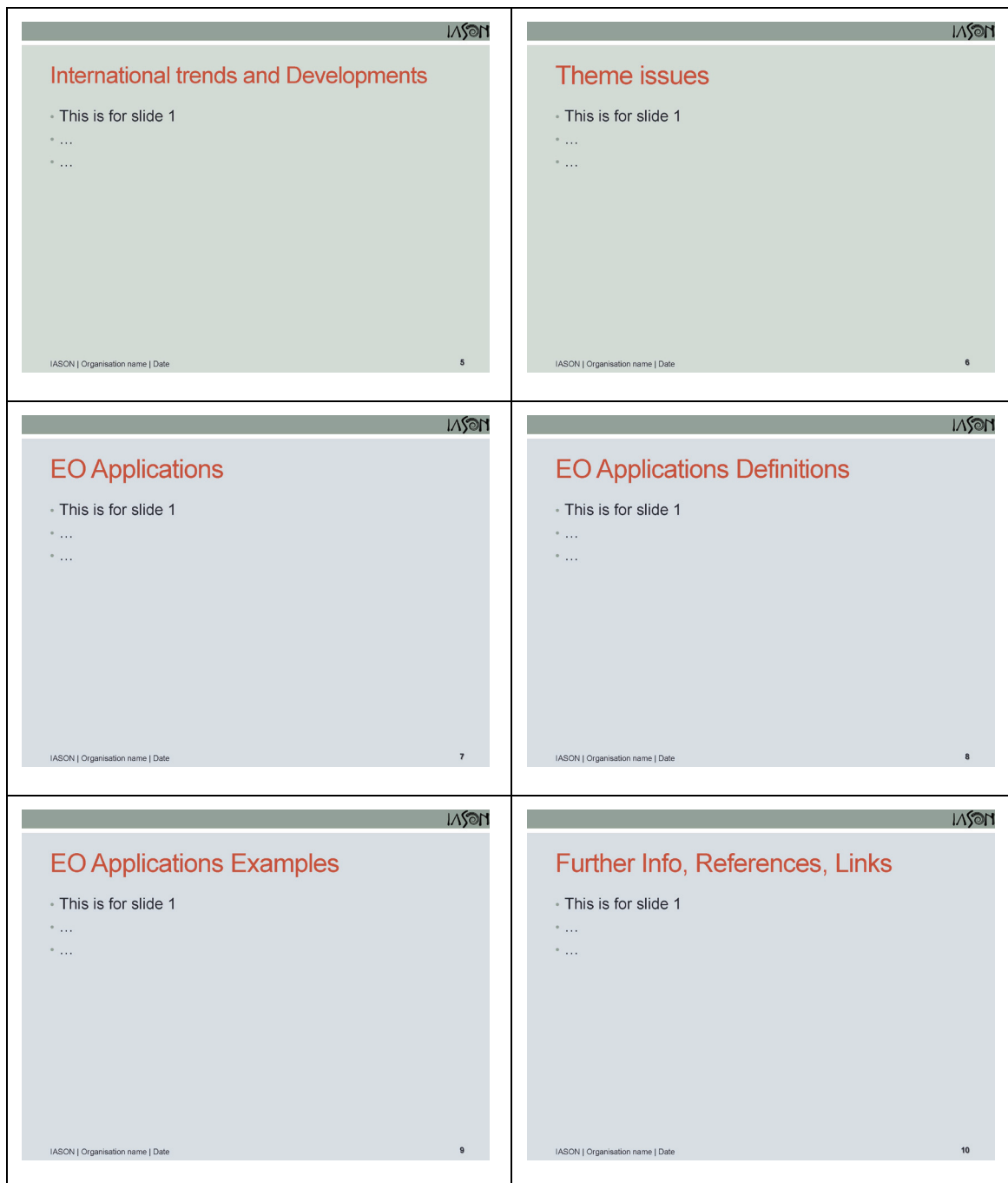


Figure 4 The IASON EO applications information package and toolkit MPP Template

3. CONCLUSIONS

Currently a full EO applications information package and toolkit regarding agriculture has been implemented (ANNEX I). Furthermore four more packages have been

deployed presenting best cases regarding EO applications in the field of disasters, energy, biodiversity and water (ANNEX I).

The next step is to implement the whole EO application information package and toolkit structure in the IASON Virtual Meeting Place (VMP). As a result all the IASON training, twinning and information material will be found in a single section of the IASON web site. The material described previously will be the seeding point for the development of the above mentioned activity.

It must be underlined that the creation of the EO applications information package and toolkit will be an ongoing activity during the project's lifetime, where new material will be added the dedicated web site section by the consortium members and web site users, thus enriching the IASON Common Information Platform (CIP).

ANNEX I

The Agriculture EO information package and toolkit

<h2 style="text-align: center;">EARTH OBSERVATION FOR AGRICULTURE</h2> <p style="text-align: center;">Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas (IASON)</p> <p style="text-align: center;">Mark Noort HCP International</p> <p style="text-align: center;"><small>IASON project is co-funded by the European Commission under the Grant Agreement 603534; Theme [ENV.2013.6.5-4 ENV.2013.6.5-4]</small></p> <p style="text-align: center;"><small>IASON HCP 5/2014</small></p> <p style="text-align: right;">1</p>	<h2 style="text-align: center;">Content</h2> <ul style="list-style-type: none"> • General assessment of the state-of-the-art of earth observation • Major trends and developments in the application field • Description of earth observation solutions <p style="text-align: center;"><i>Earth Observation helps you: save money save lives save the environment</i></p> <p style="text-align: center;"><small>IASON HCP 05/2014</small></p> <p style="text-align: right;">2</p>
<h2 style="text-align: center;">Introduction to Theme</h2> <h3 style="text-align: center;">SCOPE</h3> <p>In relation to crop farming and livestock farming, the term "agriculture" may be defined as: the art and science of growing plants and other crops and the raising of animals for food, other human needs, or economic gain.</p> <p>Focus on:</p> <ul style="list-style-type: none"> • Growing plants and other crops (including pasture), • Transportation of agricultural produce to the market, • Derived products and services related to agriculture with a distinctive geospatial component, such as (re-)insurance, monitoring of compliance with agricultural policies and regulations and other forms of (risk) management. <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">3</p>	<h2 style="text-align: center;">Problem Statement</h2> <h3 style="text-align: center;">Dimensions to characterize farmers' operations</h3> <ol style="list-style-type: none"> 1. Type of agriculture: crops, livestock, fishery/aquaculture, forestry. 2. Purpose / goal of agricultural activity, such as subsistence farming, market-oriented farming or a mixture of subsistence and market-oriented farming. 3. Property structure and means for engagement in agricultural activities: human, financial and social/cultural capital employed, such as ownership of and access land and means, tenancy arrangements, credit facilities, government policy and subsidies (e.g. sharecropping, cooperative farming, communal lands, etc.). 4. Technology level: low, medium, high (e.g. precision agriculture is part of high level technology). <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">4</p>
<h2 style="text-align: center;">International trends and Developments (Trends)</h2> <ul style="list-style-type: none"> • Food security and increased production and productivity; • Adaptation to and mitigation of the effects of climate change; • Empowering local communities, bridging the rural digital divide; • Food prices and markets; • Risk management (including insurance). <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">5</p>	<h2 style="text-align: center;">International trends and Developments (Drivers)</h2> <ul style="list-style-type: none"> • the increasing world population, • environmental factors (including climate change), • the availability of water resources, • increasing urbanization and growing middle class population -> increased consumption and changing consumption patterns • land management (land as a scarce resource). <p style="text-align: center;"><small>IASON Organisation name Date</small></p> <p style="text-align: right;">6</p>

International trends and Developments

- Population growth ↑
- Protein consumption ↑
- Global warming ↑
- Energy crops ↑
- Food prices ↑
- Land & soil quality ↓
- Available land & water ↓
- % Rural population ↓

World food production must rise by 50% in 2030 to meet increasing demand
Source: FAO/UN, 2008

IASON | Organisation name | Date 7

Theme issues Food security & increased production / productivity

- Food security in terms of avoiding hunger and undernourishment;
- Food security in terms of increased demand, production and productivity should go up;
- Food security in terms of sustainable management of natural resources;
- Food security in terms of increased resilience with respect to the effects of climate change and disasters / pests;
- Food security in terms of conflicting interests: biofuels may lead to more income for the farmer, but also to higher food prices in general.

IASON | Organisation name | Date 8

Theme issues Links-References

Sustainable agricultural productivity growth and bridging the gap for small family farms (for G20; 2012)

World agriculture towards 2030/2050 – the 2012 revision (FAO; 2012)

Food and water: analysis of potentially new themes in water management - future trends and research needs (FutureWater; 2010)

IASON | Organisation name | Date 9

Theme issues Links-References

The state of food insecurity in the world - economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition (IFAD, WFP, FAO; 2012)

Agricultural outlook 2013 – 2022 - highlights (OECD, FAO; 2013)

The state of food and agriculture – investing in agriculture for a better future (FAO; 2010)

IASON | Organisation name | Date 10

Theme issues Climate change

- Climate will likely be substantially warmer in most parts of the world;
- Water availability for agriculture will be reduced;
- More extreme weather events will occur (prolonged drought, heavy rainfall, heat waves, frost, etc.);
- Danger of pests and diseases will increase.

IASON | Organisation name | Date 11

Theme issues Climate change

A framework for developing a climate-smart agriculture strategy and investment proposals (FAO; 2012)

IASON | Organisation name | Date 12


<p style="text-align: right;">IASON</p> <h3>Theme issues Links-References</h3> <p>Climate change and food security: a framework document (FAO)</p> <p>The state of the world's land and water resources for food and agriculture – managing systems at risk (FAO; 2014)</p> <p>Water-food-energy nexus: towards a widening of the water agenda (FutureWater; 2013)</p> <div style="text-align: right;">  </div> <p>IASON Organisation name Date 13</p>	<p style="text-align: right;">IASON</p> <h3>Theme issues Links-References</h3> <p>Climate-smart agriculture - increased productivity and food security, enhanced resilience and reduced carbon emissions for sustainable development (World Bank; 2011)</p> <p>A growing interest 2 - climate and economic impacts on the plant sector (IGES; 2012)</p> <p>Uses and limitations of observations, data, forecasts, and other projections in decision support for selected sectors and regions (NASA; 2008)</p> <div style="text-align: right;">  </div> <p>IASON Organisation name Date 14</p>
<p style="text-align: right;">IASON</p> <h3>Theme issues Empowering local communities</h3> <ul style="list-style-type: none"> • Local communities as drivers to increase production and productivity in vulnerable areas to achieve food security; • Sustainable management of natural resources at the local level; • Reduce post-harvest transportation and storage losses; • Accessible, timely and affordable information on food prices and markets for farmers; • Support to risk management in the form of (index-based) insurance schemes. <p>IASON Organisation name Date 15</p>	<p style="text-align: right;">IASON</p> <h3>Theme issues Links-References</h3> <p>Sustainable agricultural productivity growth and bridging the gap for small family farms (for G20; 2012)</p> <p>Smallholder certification in biomass supply chains – guidance manual (CREM; 2013)</p> <p>Smallholder farmers can feed the world (IFAD)</p> <div style="text-align: right;">  </div> <p>IASON Organisation name Date 16</p>
<p style="text-align: right;">IASON</p> <h3>Theme issues Links-References</h3> <p>The new harvest – agricultural innovation in Africa (Juma; 2011)</p> <p>e-Sourcebook ICT in agriculture - Connecting smallholders to knowledge, networks, and institutions (World Bank; 2011)</p> <p>Guide for regional integrated assessments: handbook of methods and procedures (AgMIP; 2013)</p> <div style="text-align: right;">  </div> <p>IASON Organisation name Date 17</p>	<p style="text-align: right;">IASON</p> <h3>Theme issues Food prices & markets</h3> <ul style="list-style-type: none"> • Improve physical market infrastructure and transport to and from markets; • Improve market transparency; • Improve market institutions; • Sustainable management of the whole value chain: include costs of externalities; • Increase resilience of vulnerable farmer and consumer communities. <p>IASON Organisation name Date 18</p>

<p style="text-align: right;">IASON</p> <h3>Theme issues Links-References</h3> <p>Agricultural policy monitoring and evaluation 2013 - OECD countries and emerging economies (OECD; 2013)</p> <p>Agricultural value added services (AgriVAS): market entry toolkit</p> <p>Spatial patterns of food staple production and marketing in South East Africa: implications for trade policy and emergency response (MSU; 2009)</p> <div style="display: flex; justify-content: center; align-items: center;">   </div> <p style="font-size: small;">IASON Organisation name Date 19</p>	<p style="text-align: right;">IASON</p> <h3>Theme issues Risk management</h3> <ul style="list-style-type: none"> • Improved prediction capability for detecting possible calamities; • Improved early warning systems and general information provision on agro-meteorological conditions; • Improved physical protection against extreme events; • Sustainable management of natural resources; • Insurance schemes for risk coverage. <p style="font-size: small;">IASON Organisation name Date 20</p>
<p style="text-align: right;">IASON</p> <h3>Theme issues Links-References</h3> <p>The landscape of micro-insurance in Africa 2012 (Munich Re; 2012)</p> <p>Weather index-based insurance in agricultural development – a technical guide (IFAD; 2011)</p> <p>Rainfall variability, food security and human mobility – an approach for generating empirical evidence (UNU-EHS; 2012)</p> <div style="display: flex; justify-content: center; align-items: center;">   </div> <p style="font-size: small;">IASON Organisation name Date 21</p>	<p style="text-align: right;">IASON</p> <h3>Earth observation for agriculture</h3> <p>Three levels of interaction within a country:</p> <ul style="list-style-type: none"> • Country level, focusing on policy, research and innovation; • Agro-ecological zone or watershed level, focusing on extension services and management of regional resources; • Farm level, focusing on advice and income optimization. <p style="font-size: small;">IASON Organisation name Date 22</p>
<p style="text-align: right;">IASON</p> <h3>Earth observation for agriculture</h3>  <p style="font-size: x-small;"><i>Remote sensing images showing agriculture patterns (Geospatial World)</i></p> <p style="font-size: small;">IASON Organisation name Date 23</p>	<p style="text-align: right;">IASON</p> <h3>EO Applications Definitions</h3> <h4>Country level: earth observation contribution</h4> <ul style="list-style-type: none"> • Agricultural knowledge and information systems: parcel identification and measurement, geo-statistics and crop identification, field survey, subsidy and policy monitoring and control, • National crop and yield monitoring. • Transport infrastructure and transport to market (food chain management), • Land rights, • Market information. <p style="font-size: small;">IASON Organisation name Date 24</p>

<p style="text-align: right;">IASON</p> <h3>EO Applications Example: agricultural information systems</h3>  <p><i>Agricultural parcel (blue) one single crop group from a single farmer; farmers' block/plot (red) one single or several crop groups from a single farmer; and physical block (yellow) one single or several crop groups from one or several farmers. (GeoCAP, JRC)</i></p> <p>IASON Organisation name Date 25</p>	<p style="text-align: right;">IASON</p> <h3>EO Applications Example: agricultural information systems</h3> <ul style="list-style-type: none"> Parcel identification and measurement, geo-statistics and crop identification, field survey, subsidy and policy monitoring and control. Combines data and information on land use, land administration, crop monitoring and agro-ecological zones for better decision making; Earth observation improves accuracy, enables more frequent and better monitoring, coverage of large (not easily accessible) areas and facilitates integration of information; Cost estimate: total cultivated area 100 – 120 k€ / country, mapping of different crops and parcels 1.5 -2.5 € / km²; Main challenges: cost, capacity, data access. <p>IASON Organisation name Date 26</p>
<p style="text-align: right;">IASON</p> <h3>Further Info, References, Links agricultural information systems</h3> <p>GeoCAP (European Union): digital land parcel identification, parcel area management, land cover type, compliance monitoring</p> <p>USDA (USA): information system(s) for compliance and regulatory use, cropland data, soil modelling, etc. based on common land units</p> <p>SICA (Colombia): design, monitoring and tracking of coffee farming activities</p> <p>SOMABRASIL (Brazil): system for agricultural observation and monitoring</p> <p>Federal GIS Agricultural Atlas (Russia)</p>  <p>IASON Organisation name Date 27</p>	<p style="text-align: right;">IASON</p> <h3>EO Applications Definitions Agro-ecological zone / watershed level: earth observation contribution</h3> <ul style="list-style-type: none"> Site evaluation (sustainable land use, suitability analysis), Regional crop and yield monitoring, Water management, Weather prediction. <p>IASON Organisation name Date 28</p>
<p style="text-align: right;">IASON</p> <h3>EO Applications Example: Site Evaluation</h3>  <p><i>Examples of reference parcels super-imposed on aerial orthoimagery (colours correspond to different land cover types) (GeoCAP, JRC)</i></p> <p>Main challenges: cost, capacity, data access</p> <p>IASON Organisation name Date 29</p>	<p style="text-align: right;">IASON</p> <h3>EO Applications Example: Site Evaluation</h3> <ul style="list-style-type: none"> Analysis and modelling of agro-climatic data, biomass and yield data, soil suitability to achieve optimum and sustainable use of agro-ecological zones; Earth observation provides the input for modelling and analysis: land cover, land use change, crop identification and monitoring, water resources, soil mapping and climate modelling with more accuracy, wider coverage and higher frequency than conventional methods. Cost estimate: on case-by-case basis (costs of crop monitoring + modelling). Main challenges: cost, capacity, data access. <p>IASON Organisation name Date 30</p>

**Further Info, References, Links
Site Evaluation**

Global Agro-Ecological Zones (GAEZ): initiative of IIASA and FAO for assessing agricultural resources and potential. A model is developed for sustainable utilization of land resources, agricultural development and food security that can be used as baseline for elaboration of local models and plans.




IASON | Organisation name | Date 31

**EO Applications Definitions
Farm level: earth observation contribution**

- **Farm site evaluation,**
- **Precision agriculture:** machine guidance, precise planting and harvesting, fertilization advice, yield monitoring, water management advice,
- **Pest management,**
- **Weather prediction:** temperature, rainfall (amount, geographical distribution, intensity, timing), extremes (rainfall, drought, wind, hail, etc.).

IASON | Organisation name | Date 32

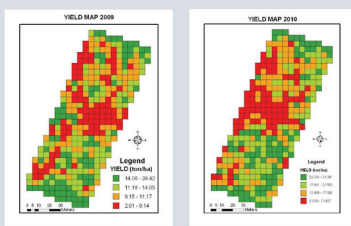
EO Applications Example: Precision agriculture 1



Source: Mijn Akker, Netherlands & FieldLook, Ethiopia (eLeaf 2012 & 2013)

IASON | Organisation name | Date 33

EO Applications Example: Precision agriculture 2



Vineyard yield map and comparison 2010 and 2009
Source: Fountas

IASON | Organisation name | Date 34

EO Applications Example: Precision Agriculture

- Machine guidance, precise planting and harvesting, fertilization advice, yield monitoring, water management advice.
- High-resolution earth observation provides accurate information with high frequency that serves, after processing, to reduce fertilizer input, increase efficiency of water use, etc.
- Cost estimate: 10 -15 € / ha.
- Main challenges: affordability, cloud cover.








IASON | Organisation name | Date 35

**Further Info, References, Links
Precision Agriculture**

Although most geospatial applications for precision agriculture are based on satellite navigations and GIS, there are quite a number of products and services offered (or in development) by commercial EO-providers, such as Digital Globe (AgroWatch), Blackbridge, Airbus (FarmStar), eLeaf (FieldLook), Cropio, Microlimages (TNTmips), etc.

IASON | Organisation name | Date 36

The Fires EO application information package & toolkit (Environment, Climate, Disasters)

 <h3>FIRES EO APPLICATIONS</h3> <p>Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas (IASON)</p> <p><small>IASON project is co-funded by the European Commission under the Grant Agreement 603534, Theme [ENV.2013.6.5-4 ENV.2013.6.5-4]</small></p> <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">1</p>	 <h3>Content</h3> <ul style="list-style-type: none"> EO Applications Success Stories Examples <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">2</p>
 <h3>Introduction to Theme Fires - Disasters (Greece)</h3> <ul style="list-style-type: none"> Greece suffers from disastrous wildfires every year, especially during the summer months. In recent years large areas of forests were destroyed, while in many cases residential areas were threatened and human lives were lost. Therefore, it is vital to develop an organized national coordination policy aiming at civil and environmental protection. <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">3</p>	 <h3>Problem Statement</h3> <ul style="list-style-type: none"> One of the most serious problems during and after the occurrence of fires is to estimate the extent of damage that occurred and how they tend to evolve In this context, remote sensing and Earth Observation satellites are a very useful tool to detect fire spots from space and to quickly estimate the extent of burned areas. The forest fires that took place so far in every region of Greece were monitored and recorded by EO Satellites such as ENVISAT of ESA, as well as SPOT, LANDSAT, METEOSAT, etc. <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">4</p>
 <h3>Theme issues</h3> <ul style="list-style-type: none"> In Greece the responsible authority for disasters management and civil protection is the General Secretariat of Civil Protection (GSCP). Since 2005 the GSCP produces prediction and vulnerability maps for the entire Greece on a daily basis. The GSCP started publishing up the vulnerability maps, in the GSCP web site only since 2007 when the most disastrous wildfires in the modern history of Greece have hit the country. <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">5</p>	 <h3>EO Applications Examples</h3> <p>The 20th of August was the day that wildfires began and raged on Friday some 40 km northeast of Athens in the village of Grammatikos.</p>  <ul style="list-style-type: none"> More than 2000 firefighters and soldiers were working to contain the blazes On Saturday, Greek authorities declared a state of emergency after the fires spread to neighboring villages On Sunday, the Greek General Secretariat for Civil Protection asked the International Charter on Space and Major Disasters for support In addition to data being made available through the Charter activation, the ESA provided the EO data from contributing satellite missions to the SAFER, the CIMES Emergency Response Service. The wildfires have burned down at least 15 000 hectares of land and forced thousands to flee their homes. <p>http://safer.emergencyresponse.eu/site/FO/scripts/myFO_accueil.php?lang=EN http://www.balkangeo.net/images/stories/deliverables/BalkanGEONet_D5.2.pdf</p> <p>Global prediction map for forest fires on the 20th of August 2009, provided by GSCP on the web.</p> <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">6</p>

EO Applications Examples




(a) Extent of burned areas in Grammatikos, Athens, during 24th of August 2009, satellite image provided by MERIS/ESA (b) Extent of burned areas in Chios during 15th of August 2012, satellite image provided by MODIS/NASA.

http://www.balkangeo.net/images/stories/4deliverables/Balkan/GEONet_DS2.pdf

- A comparison between the case of the Greek fires during summer 2007 and 2009 can lead to few important conclusions. The GSCP has gained a significant amount of experience on how to exploit the EO data before, (vulnerability maps) and during a fire crisis. The GSCP has also produced GIS data in vector format that depicted the fire perimeter in order to increase situation awareness for all Greek organizations that deal with infrastructures (roads, bridges, infrastructure networks). In this way local but also national authorities could react rapidly within 48 hours
- However, the recent example of the wildfires in the island of Chios during the summer of 2012 that caused irreparable damage to the local ecosystem indicates that there is a lot of work that needs to be done in order to exploit the Earth Observation data available in a more fruitful way, especially at the prevention level.

IASON | Organisation name | Date 7

Theme issues

- Need to develop a satellite based information system that could not only provide information on the frequency and distribution of fires over time for the change detection research community but could also provide a near-real time tool for early detection of fires for affected user community.
- Access to near-real time fire detection, monitoring and assessment information
- Societal Benefit: agriculture, biodiversity, ecosystems, energy, climate, disasters, health

IASON | Organisation name | Date 9

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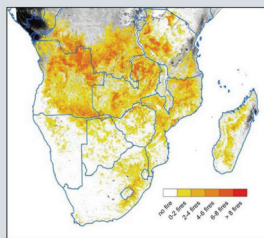
IASON | Organisation name | Date 9

EO Applications

- Near-real time broadcasts from 15 minute interval satellite passes
- Detection of fires as small as 50m X 50m area
- Fire detection rate of about 65% of all fires in South Africa
- SMS alert notification to fire managers
- Supplies several warnings to fire protection associations in South Africa
- Expansion of service to SADC region countries

IASON | Organisation name | Date 10

EO Applications Examples

Online fire detection results

Occurrence of fires per year in Southern Africa

http://geonetcab.espace-dev.fr/images/stories/successstories/fire_information.pdf

IASON | Organisation name | Date 11

Further Info, References, Links

CSIR Satellite Application Centre (SAC)
 Private Bag 11, Hatfield, Pretoria, South Africa
 P.O. Box 293, Pretoria, 0001
 +27 12 334 5600
www.csir.co.za/SAC

Thutoyo Africa (DIMVOTO)
 P. Box 504, Maseru, 6305
 P.O. Box 64, Maseru, 6305
 +27 28 708 0031
www.thutoyo.com

- http://geonetcab.espace-dev.fr/images/stories/successstories/fire_information.pdf
- <http://geonetcab.mdweb-project.org/search/main.jsf>

IASON | Organisation name | Date 12

The Energy EO applications information package and toolkit

<h3>ENERGY, CLIMATE, ENVIRONMENT EO APPLICATIONS</h3> <p>Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas (IASON)</p> <p><small>IASON project is co-funded by the European Commission under the Grant Agreement 603534, Theme [ENV.2013.6.5-4 ENV.2013.6.5-4]</small></p> <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">1</p>	<h3>Content</h3> <ul style="list-style-type: none"> EO Applications Best Practices Examples <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">2</p>
<h3>Introduction to Theme Greece: Regulatory Authority of Energy</h3> <ul style="list-style-type: none"> The Regulatory Authority of Energy (RAE) has developed a web GIS application that provides information on renewable energy sources in Greece. The application was developed using open source software The available layers include information about solar, wind, geothermic, and water energy installations and applications. It also has the ability to perform metadata queries in three different protocols (INSPIRE, CSW ISO AP, and DC) in various categories <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">3</p>	<h3>EO Applications Examples Greece: Regulatory Authority of Energy</h3> <p>The website of the Regulatory Authority of Energy provides free data regarding environment and energy</p> <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">4</p>
<h3>Further Info, References, Links</h3> <ul style="list-style-type: none"> http://www.rae.gr/geo/index.php?lang=EN http://www.rae.gr/old/en/ http://observe-fp7.eu/images/stories/Docs/pdf/DELIVERABLES/OBSERVE_D25.pdf <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">5</p>	<h3>EO Applications Examples Greece: Improved urban land cover mapping using WorldView-2 imagery, for estimating the geographical distribution of the available roof surface area for photovoltaic potential applications in urban environments</h3> <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">6</p>

Introduction to Theme

- The contemporary urban environments are more and more characterized by their densely built up areas, the excessive use of building materials that are harmful for the environment and the climate's quality, the observed congestion due to massive use of cars and the consequent emission of gas that leads to air pollution and climate change. At the same time, the organized green spaces occupy limited extent considering the urban scale. For all these reasons, the continuous evolution of the urban forms does not correspond to a sustainable development which respects the environment through time.

IASON | Organisation name | Date 7

Problem Statement

- An object-oriented approach for analyzing and characterizing the urban landscape structure at building level, using high-resolution satellite imagery of WorldView-2.
- Extracting building information such as area, rooftop surface materials, for estimating the potential of photovoltaic (PV) applications in the available building stock of the examined area.
- The study area is the city of Kalamaria in Greece. With the applied methodology, the 8-band multispectral imagery of WorldView-2 is used for object-oriented feature extraction techniques, using the additional multispectral bands of the image (Coastal Blue, Red Edge Yellow, NIR-2).

IASON | Organisation name | Date 8

EO Applications Examples

classified images

IASON | Organisation name | Date 9

EO Applications Examples

Building Orientations

IASON | Organisation name | Date 10

EO Applications Examples

Wind Direction

IASON | Organisation name | Date 11

EO Applications Examples

Surface Temperature Determination

IASON | Organisation name | Date 12

EO Applications Examples

Solar Energy Potential

Legend:

- 0.000 - 0.000
- 0.000 - 0.001 250
- 0.001 250 - 0.002 500
- 0.002 500 - 0.003 750
- 0.003 750 - 0.004 1 000

IASON | Organisation name | Date 13

EO Applications Examples

21 ΔΕΚΕΜΒΡΙΟΥ

Roof shadow during the shortest day of the year

IASON | Organisation name | Date 14

EO Applications Examples

21 ΙΟΥΝΙΟΥ

Roof shadow during the longest day of the year

IASON | Organisation name | Date 15

EO Applications Examples

The Complete DB

ΑΔΑ	ΚΑΤΗΓΟΡΙΑ	ΕΠΙΦΑΝΕΙΑ	ΕΠΙΧΕΙΡΗΣΙΑ	ΠΡΟΒΛΗΤΕΣ	ΠΡΟΣΤΑΣΙΑ	ΠΡΟΣΤΑΣΙΑ	ΠΡΟΣΤΑΣΙΑ	ΠΡΟΣΤΑΣΙΑ	ΠΡΟΣΤΑΣΙΑ
1	1	1	1	1	1	1	1	1	1

IASON | Organisation name | Date 16

Further Info, References, Links

- Stamou, A., P. Patias, A. Papadopoulos, I. Theodoridou, 2012, *Study and Analysis of WorldView-2 satellite imagery for evaluating the energy efficiency of the urban area of Kalamana, Greece*, South-Eastern European Journal of Earth Observation and Geomatics [SEJEOG], Vol 1, No 1 (2012), pp. 41-54, <http://eiojournals.lib.auth.gr/seejeog/article/view/962/1600>
- Stamou, A., P. Patias, M. Tsakiri-Strati, O. Georgoula, 2014, *Improved urban land cover mapping using WorldView-2 imagery, for estimating the geographical distribution of the available roof surface area for photovoltaic potential applications in urban environments*, [SEJEOG], Vol 3, No 2S (2014), pp. 355-358
- Antoniadou, S., A. Stamou, P. Patias, 2014, *Comparison of urban green classification methods using Quickbird, Ikonos and Worldview-2 imagery*, [SEJEOG], Vol 3, No 2S (2014), pp. 435-438
- Manika, S., A. Stamou, P. Patias, 2014, *Urban green characteristics of residential areas in Thessaloniki Greece, using high resolution satellite images*, [SEJEOG], Vol 3, No 2S (2014), pp. 573-578

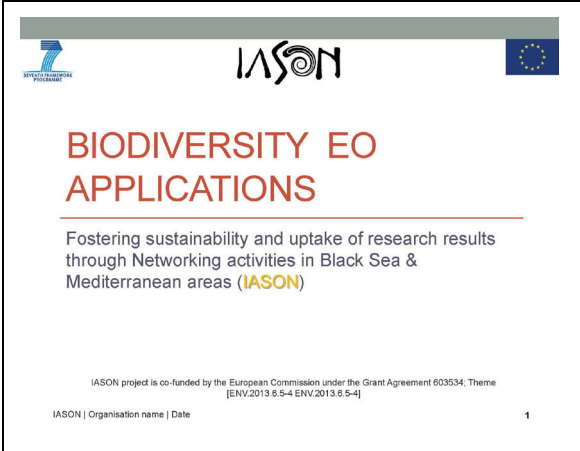

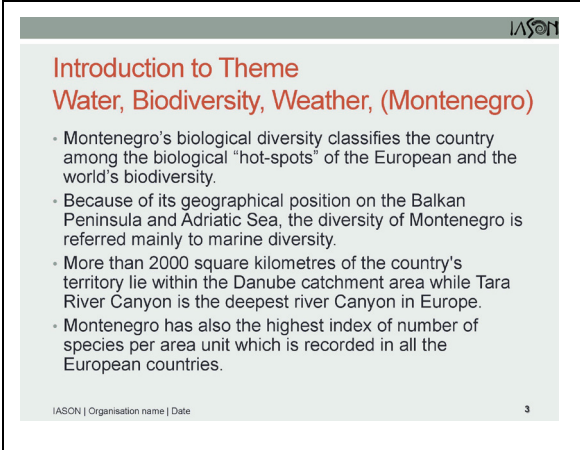
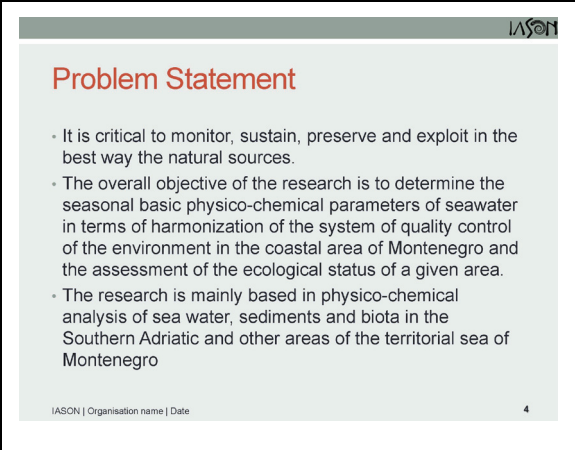
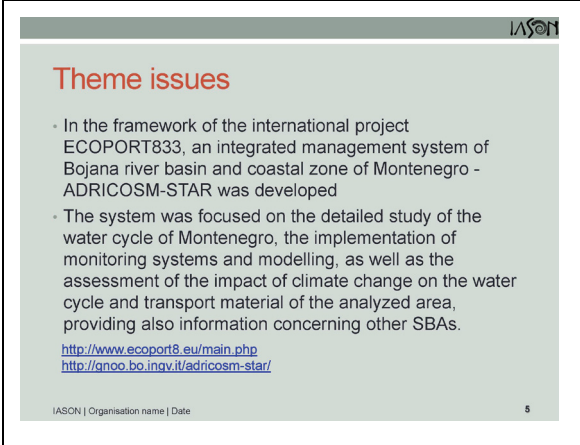
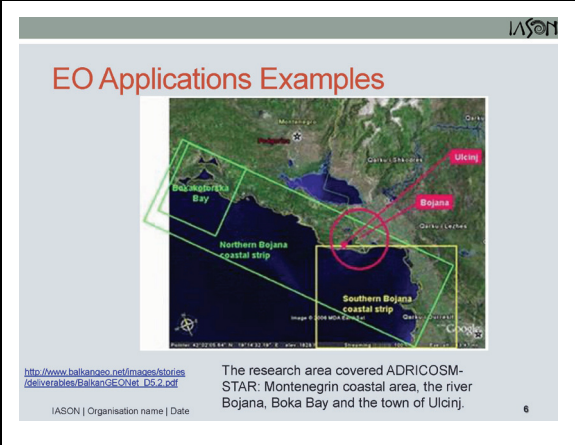
IASON | Organisation name | Date 17

General Links

- http://www.observe-fp7.eu/images/stories/roadmap/pdf/observe_roadmap_strategy_plan.pdf
- http://observe-fp7.eu/index.php?option=com_content&view=article&id=169&Itemid=255
- http://observe-fp7.eu/index.php?option=com_wrapper&view=wrapper&Itemid=252
- <http://www.youtube.com/watch?v=ih6m-Rihitk>

IASON | Organisation name | Date 18


The Biodiversity EO applications information package and toolkit

 <p>BIODIVERSITY EO APPLICATIONS</p> <p>Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas (IASON)</p> <p>IASON project is co-funded by the European Commission under the Grant Agreement 603534, Theme [ENV.2013.6.5-4 ENV.2013.6.5-4]</p> <p>IASON Organisation name Date 1</p>	 <p>Content</p> <ul style="list-style-type: none"> EO Applications Success Stories Examples <p>IASON Organisation name Date 2</p>
 <p>Introduction to Theme Water, Biodiversity, Weather, (Montenegro)</p> <ul style="list-style-type: none"> Montenegro's biological diversity classifies the country among the biological "hot-spots" of the European and the world's biodiversity. Because of its geographical position on the Balkan Peninsula and Adriatic Sea, the diversity of Montenegro is referred mainly to marine diversity. More than 2000 square kilometres of the country's territory lie within the Danube catchment area while Tara River Canyon is the deepest river Canyon in Europe. Montenegro has also the highest index of number of species per area unit which is recorded in all the European countries. <p>IASON Organisation name Date 3</p>	 <p>Problem Statement</p> <ul style="list-style-type: none"> It is critical to monitor, sustain, preserve and exploit in the best way the natural sources. The overall objective of the research is to determine the seasonal basic physico-chemical parameters of seawater in terms of harmonization of the system of quality control of the environment in the coastal area of Montenegro and the assessment of the ecological status of a given area. The research is mainly based in physico-chemical analysis of sea water, sediments and biota in the Southern Adriatic and other areas of the territorial sea of Montenegro <p>IASON Organisation name Date 4</p>
 <p>Theme issues</p> <ul style="list-style-type: none"> In the framework of the international project ECOPORT833, an integrated management system of Bojana river basin and coastal zone of Montenegro - ADRICOSM-STAR was developed The system was focused on the detailed study of the water cycle of Montenegro, the implementation of monitoring systems and modelling, as well as the assessment of the impact of climate change on the water cycle and transport material of the analyzed area, providing also information concerning other SBAs. <p>http://www.ecoport8.eu/main.php http://qnoo.bo.invg.it/adicosm-star/</p> <p>IASON Organisation name Date 5</p>	 <p>EO Applications Examples</p> <p>http://www.balianseo.net/images/stories/deliverables/BalkanSECONet_D6.2.pdf</p> <p>The research area covered ADRICOSM-STAR: Montenegrin coastal area, the river Bojana, Boka Bay and the town of Ulcinj.</p> <p>IASON Organisation name Date 6</p>

The Water EO applications information package and toolkit

<h3>WATER EO APPLICATIONS</h3> <p>Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas (IASON)</p> <p><small>IASON project is co-funded by the European Commission under the Grant Agreement 603534, Theme [ENV.2013.6.5-4 ENV.2013.6.5-4]</small></p> <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">1</p>	<h3>Content</h3> <ul style="list-style-type: none"> EO Applications Success Stories Examples <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">2</p>
<h3>Introduction to Theme DESAMBEM – DEVELOPMENT OF A SATELLITE METHOD FOR BALTIC SEA ECOSYSTEM MONITORING</h3> <ul style="list-style-type: none"> Use EO to provide up-to-date information on the state of the seas and oceans Measurement and prediction of temperature levels, chlorophyll concentrations and total primary production of organic matter and oxygen in the Baltic Sea Determination of radiant energy inflow and utilization in the Baltic ecosystem Ability to predict the Baltic Sea ecosystem changes <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">3</p>	<h3>Problem Statement</h3> <ul style="list-style-type: none"> The Baltic Sea is an enclosed sea with a high level of biological productivity, but seriously endangered by the effects of economic development. The photosynthetic production of algae is the first link in the food chain of marine organisms and is an important source of energy for land ecosystems. By regulation of oxygen and CO₂ in the atmosphere, the photosynthesis in the sea is one the main factors affecting the greenhouse effect and the climate of the Earth. <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">4</p>
<h3>Theme issues</h3> <ul style="list-style-type: none"> Development of bio-optical models as a base of modern procedures for the Baltic ecosystem remote sensing monitoring. Development of an operational algorithm for the Baltic ecosystem remote sensing. Satellite data used: <ul style="list-style-type: none"> Meteo satellites: METEOSAT, TIROS-N/NOAA EO satellites: MODIS, ERS 2 <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">5</p>	<h3>EO Applications</h3> <ul style="list-style-type: none"> EO is very effective for complete and up-to-date information on the state of the seas and ocean The implementation of the project began in early 2010 with the initiation of another large-scale research project SatBaltic - Satellite Monitoring of the Baltic Sea Environment. The expected end result of the SatBaltic project is the establishment of an operational system for the rapid and efficient determination of the characteristics of the Baltic Sea in the form of maps. <p><small>IASON Organisation name Date</small></p> <p style="text-align: right;">6</p>

<p style="text-align: right;">IASON</p> <h3>EO Applications Examples DESAMBEM</h3>  <ul style="list-style-type: none"> • Quasi-True-Color Images • Surface Chlorophyll a Concentration • Surface Chlorophyll a Concentration with extrapolation for cloud-covered area • Surface Photosynthetically Active Radiation (PAR) • Sea Surface Temperature with extrapolation for cloud-covered area • Total Primary Production • Total Primary Production with extrapolation for cloud-covered area <p>http://geonetcab.espace-dev.fr/images/stories/successstories/Baltic_Sea_ecosystem.pdf</p> <p>IASON Organisation name Date 7</p>	<p style="text-align: right;">IASON</p> <h3>Further Info, References, Links</h3> <ul style="list-style-type: none"> • Institute of Oceanology of Polish Academy of Sciences ul. Powstańców Warszawy 55 81-712 Sopot HUhttp://www.iopan.gda.pl/desambem/index.php +48 058 551 72 81 • http://geonetcab.espace-dev.fr/images/stories/successstories/Baltic_Sea_ecosystem.pdf • http://geonetcab.mdweb-project.org/search/main.jsf <p>IASON Organisation name Date 8</p>
<p style="text-align: right;">IASON</p> <h3>Introduction to Theme FLOREO – FLOOD RISK EARTH OBSERVATION MONITORING</h3> <ul style="list-style-type: none"> • FLOREO (Demonstration of ESA Environments in support to FLOod Risk Earth Observation monitoring) was an ESA PECS project and formed part of the programme devoted to support Czech research and industry in cooperation with ESA. • The project was oriented on development and implementation of relevant EO-based services in the Czech Republic to support existing hydrological monitoring activities, especially snow melt and surface water runoff that contribute to flooding events <p>IASON Organisation name Date 9</p>	<p style="text-align: right;">IASON</p> <h3>Theme issues</h3> <ul style="list-style-type: none"> • Use of EO data as a tool to deliver timely, spatially exhaustive and consistent information about different parameters of the land surface. • New possibilities for hydrological monitoring systems that are used in flood risk analysis. • The information about snow, as an important component in hydrological monitoring systems, is delivered by means of EO in full coverage • Other land surface properties and dynamics monitored by EO allow more detailed predictions of parameters, for instance surface water runoff, that contribute to flooding events <p>IASON Organisation name Date 10</p>
<p style="text-align: right;">IASON</p> <h3>EO Applications</h3> <ul style="list-style-type: none"> • Use of EO data as a tool to deliver timely, spatially exhaustive and consistent information about different parameters of the land surface • Combination of the different spatial and temporal scales of imagery, as well as on employing optical and radar technology • The use of medium and coarse resolution satellite imagery with a high temporal resolution enabled a focus on snow cover mapping & monitoring, while keeping costs in check. <p>IASON Organisation name Date 11</p>	<p style="text-align: right;">IASON</p> <h3>EO Applications</h3> <ul style="list-style-type: none"> • The estimation of soil moisture was approached from two different angles: use of a soil water modelling technique (by means of soil and precipitation data) and use of soil moisture products derived from EO data. • An important component of FLOREO system is snow cover monitoring, especially change detection over time. Middle resolution (500 m) satellite data acquired from the MODIS multi-spectral sensor of Terra satellite with a high temporal resolution were used for this purpose. • (http://www.floreo.cz/Zdroje-dat/MODIS.aspx). <p>IASON Organisation name Date 12</p>

<p style="text-align: right;">IASON</p> <h3>EO Applications Examples</h3>  <p>Combination of EO, in-situ measurements and GIS models allows advanced and more reliable monitoring and Flood forecasting</p> <p>An operational service for snow cover monitoring from MODIS and in-situ measurements has started in February 2011 and can be used as an example</p> <p><i>Snow cover, 9th February 2009, Czech Republic</i></p> <p>http://www.floreo.cz/Zdroje-dat/MODIS.aspx</p> <p>http://geonetcab.espace-dev.fr/images/stories/successstories/flood_risk.pdf</p> <p>IASON Organisation name Date 13</p>	<p style="text-align: right;">IASON</p> <h3>Further Info, References, Links</h3> <p>Charles University in Prague Faculty of Science Albertov 6 128 43 Prague 2 Czech Republic http://www.floreo.cz/?lang=en-US</p> <ul style="list-style-type: none"> • http://geonetcab.espace-dev.fr/images/stories/successstories/flood_risk.pdf • http://geonetcab.mdweb-project.org/search/main.jsf • http://www.floreo.cz/Zdroje-dat/MODIS.aspx <p>IASON Organisation name Date 14</p>
<p style="text-align: right;">IASON</p> <h3>Introduction to Theme Disasters (Romania)</h3> <ul style="list-style-type: none"> • Use of satellite data for monitoring and assessing the damage produced by floods in June – July 2010 in Romania and Moldova • In flood management, identification, delineation and mapping of affected areas are important activities, Earth observation by remote sensing being an instrument which can reduce the costs of these activities and improve the quality of the management process. <p>IASON Organisation name Date 15</p>	<p style="text-align: right;">IASON</p> <h3>Theme issues</h3> <ul style="list-style-type: none"> • During the days at the end of June 2010 heavy rainfalls unleashed floods in northern and eastern Romania • Significant material damages and human casualties were registered in 481 localities. • The highest flood risk was recorded on Siret, Prut and Jijia rivers with the waters repeatedly rising above the danger levels • On the 28th of June, the ROSA, the Romanian focal point for the Copernicus ERS (Emergency Response Service) requested the activation of the service for three areas: Botosani, Covasna and Galati. On the 20th of July, another activation request was submitted for the southern Romania-Moldova border due to the flood events and the increased flood risk on the Prut River. The requests were accepted and the DLR ZKI (a service of the German Remote Sensing Center – DFD), being in permanent contact with the ROSA, coordinated the satellite image acquisition and crisis maps production. <p>IASON Organisation name Date 16</p>
<p style="text-align: right;">IASON</p> <h3>EO Applications</h3> <ul style="list-style-type: none"> • Using newly acquired SPOT, TerraSAR-X and RADARSAT data, archive SPOT and aerial imagery as well as land use and land cover ancillary data, experts from the ZKI, the ROSA, Meteo Romania and the CRUTA worked together and produced 35 crisis and reference maps showing the extent of the floods and the damaged areas - agriculture fields and infrastructure. • This is a project oriented towards achieving a national service able to offer products obtained from processed satellite imagery, useful for management of emergency situations. The service was designed to ensure compatibility with the GMES Emergency Response Core Service and delivers basic geoinformation and emergency products <p>IASON Organisation name Date 17</p>	<p style="text-align: right;">IASON</p> <h3>EO Applications Examples</h3>  <p>Flood evolution map, Radauti-Prut Commune, Botosani country</p> <p>http://www.balkangeo.net/images/stories/deliverables/BalkanGEO-net_D5.2.pdf</p> <ul style="list-style-type: none"> • Before providing valuable information, satellite images must pass through several phases: acquisition and reception, processing, analysis and interpretation of final products. • Products with hydrological characteristics specific to each phase of the emergency situations management can be obtained by correlation with in-situ data. • Therefore, for a potential flood area it is necessary to produce an overview map in order to analyze the situation on the ground (dams, railways, roads and other infrastructure elements that can be affected by floods). <p>IASON Organisation name Date 18</p>

EO Applications Examples

- Pre-event satellite images can be used.
- If the areas are already affected by floods, pre and post event data is mandatory for a good analysis
- During the operations in 2010, the damage assessment was made using the Land Parcels Identification System - IACS/LPIS data and Corine Land Cover 2006. LPIS is a 1-meter resolution database, permanently updated, used in the frame of Agency for Payments and Intervention for Agriculture

Technological process to achieve flood maps

http://www.balkangeo.net/images/stories/Deliverables/BalkanGEO-Ver_D3.2.pdf

IASON | Organisation name | Date 19

EO Applications Examples

Bulgaria: Assessment of Flood Risk

- In Bulgaria water management is organized at drainage basin level, and is implemented by four drainage basin administrations under the Ministry of the Environment and Water.
- Preliminary assessment of flood risk is prepared for each area of the water basins or the portion of international river basin that is located in the country.
- The project aims to assess the potential risks based on available and accessible information such as EO data, topographic maps and studies for sustainable development, in particular concerning the impact of climate change on the occurrence of floods.
- Different thematic maps are made using EO data

IASON | Organisation name | Date 20

EO Applications Examples

Bulgaria: Assessment of Flood Risk

Assessment of flood risk

A map of river basins

IASON | Organisation name | Date 21

Further Info, References, Links

- <http://wp.moew.government.bg/purn/drbd/?lang=en>
- <http://wp.moew.government.bg/purn/earbd/?lang=en>
- <http://wp.moew.government.bg/purn/bsbd/?lang=en>
- http://www.wabd.bg/bg/index.php?option=com_content&task=view&id=987&Itemid=72
- http://observe-fp7.eu/images/stories/Docs/pdf/DELIVERABLES/OBSERVE_D25.pdf

IASON | Organisation name | Date 22

EO Applications Examples

Slovenia: Drought Management Center for Southeastern Europe DMCSEE

- Prepare regional drought monitoring, analysis, early warning products;
- to promote and strengthen the capacity for drought preparedness, monitoring and management;
- exchange of knowledge, experience and best practice on drought issues;
- to raise awareness of decision maker, relevant stakeholders and end-users about importance of effective drought preparedness, monitoring and management.

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EO Applications Examples

Slovenia: Drought Management Center for Southeastern Europe DMCSEE

GIS web-based application for drought products

IASON | Organisation name | Date 24

<p style="text-align: right;"></p> <h3>Further Info, References, Links</h3> <ul style="list-style-type: none">• http://www.dmcsee.eu/• http://www.arso.gov.si/en/• http://observe-fp7.eu/images/stories/Docs/pdf/DELIVERABLES/OBSERVE_D25.pdf <p>IASON Organisation name Date 25</p>	<p style="text-align: right;"></p> <h3>Genral Links</h3> <ul style="list-style-type: none">• http://www.balkangeo.net/images/stories/deliverables/BalkanGEONet_D5.2.pdf• http://geonetcab.espace-dev.fr/images/stories/successstories/flood_risk.pdf• http://geonetcab.mdweb-project.org/search/main.jsf• http://www.observe-fp7.eu/images/stories/roadmap/pdf/observe_roadmap_strategy_plan.pdf• http://observe-fp7.eu/index.php?option=com_content&view=article&id=169&Itemid=255• http://observe-fp7.eu/index.php?option=com_wrapper&view=wrapper&Itemid=252• http://www.youtube.com/watch?v=ih6m-Rihitk <p>IASON Organisation name Date 26</p>
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