National Observatory of Athens, GEO-CRADLE Project Coordinator

Space Research and Technology Institute, GEO-CRADLE Partner

# GEO-CRADLE Regional Workshop in Sofia, Bulgaria 24 March 2017


# MINUTES

The GEO-CRADLE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 690133.

## Objective & Outline

The objective of this regional workshop was on the one hand to demonstrate the capacity available in Bulgaria in Earth Observation (EO), geospatial data acquisition and processing, as well as to present successful stories from past projects and existing products and services using EO data. On the other hand the workshop aimed to identify the existing local challenges hindering the EO market uptake, in order to explore ways to enhance growth and innovation in the geo-information sector in the region.

The event was jointly organised by GEO-CRADLE Project Coordinator National Observatory of Athens (NOA) and the Project Partner Space Research and Technology Institute (SRTI). It was kindly hosted by the Central Administration of the Bulgarian Academy of Sciences and took place on March 24th 2017.

Representatives from public administration, academia and industry were invited and attended the workshop, thus participants were also provided with a unique cross-sector networking opportunity, which supported knowledge sharing and enhanced cooperation between them.

## Opening

Speaker: **Mr. Hristo Nikolov** – Space Research and Technology Institute (SRTI)

Mr. Hristo Nikolov opened the meeting welcoming the participants and thanking especially the speakers and the GEO-CRADLE Project Coordination Team for their cooperation. He wished a fruitful meeting and a productive day to all.

## Welcome

Speaker: **Professor Kristalina Stoykova** – Bulgarian Academy of Sciences (BAS)

Professor Kristalina Stoykova, BAS Scientific Secretary responsible for the research fields "Climate change, risks and resources" and "Astronomy, space studies and technologies", expressed high appreciation for the involvement of SRTI-BAS as partner in such an important project with impact at regional and European level. She pointed out that enhancing the capacity of the Bulgarian stakeholders in EO domain is of crucial importance not only for the partner institute, but also for the whole scientific community and for their business partners. Professor Stoykova emphasized that the involvement of Bulgarian entities in European framework research programs is the best opportunity for them to become part of large international teams and thus to contribute to solutions for the challenges addressed by the pilot activities of GEO CRADLE. She invited all the participants of the workshop to contribute actively to the discussion in order to make this meeting a successful one.

## Opportunities within the Framework Programme "Horizon 2020"

Speaker: **Mr. Dimitar Asenov** – Ministry of Education, Youth and Science of Bulgaria


Mr. Dimitar Asenov, Officer from the Science Directorate, highlighted the importance of Horizon 2020 and reported the achievements of the Bulgarian partners. He underlined that up to now 150 organizations from Bulgaria participate in 252 projects in H2020, while their success rate in FP7 calls is close to the average for EU (16.4%). Key factors for involvement of more parties in the next calls is the national network of NCPs working towards this goal, as well as the participation of the members of the Program committees in policy adoption for the next stage of H2020. The challenges for the Bulgarian scientific community include the creation of centres for competence and excellence in the areas of Innovation and Smart Specialization Strategy, the need for more active transfer of knowledge from academia to industry, and more intensive inclusion of young scientists in projects' activities.

## Presentation of the GEO CRADLE project

Speaker: **Mr. Lefteris Mamais** – GEO-CRADLE Project Coordination Team NOA

Mr. Lefteris Mamais, Technical Manager of GEO-CRADLE, presented the objectives, the consortium and the scope of the project. He highlighted that GEO-CRADLE is a project that aims at fostering regional cooperation and a roadmap for GEO and Copernicus implementation in North Africa, Middle East and the Balkans. He referred to the consortium of the project, which covers the complete EO value chain, ensuring sufficient representation of the most important players in the Region of Interest (25 partners from 20 countries from 3 continents).


Mr. Mamais explained the project's overall approach and pillars, which include the Inventory of capacities and user needs in the RoI, the Gap Analysis, the Maturity Indicators and Priorities, the Pilots towards regional challenges, the Regional Contribution to GEOSS & Copernicus, and in parallel the Dissemination & Engagement and the Impact Analysis in the end. He emphasized that GEO-CRADLE identifies common needs, creates synergies (regional cooperation), and integrates capacities (monitoring capabilities and networks, as well as scientific skills); and will finally propose / set up large scale regional initiatives based on the Earth Observation (space based and in-situ) for addressing societal priorities in different thematic aspects.

## ESA related activities in Bulgaria

Speaker: **Mr. Emil Komatichev** – Ministry of Economy of Bulgaria

Mr. Emil Komatichev, Officer from the Economic Promotion Policies Directorate of the Ministry of Economy, which is in charge of the collaboration with ESA, provided information on the current status and the future steps of the implementation of the Plan for European Cooperating States (PECS) Charter between Bulgaria and the European Space Agency (ESA). In April 2015 the consent was given to

cooperation on space exploration and absorption for peaceful purposes, and Bulgaria is now preparing for effective accession as a full member of ESA. In February 2016 there was the payment of the first financial contribution, the implementation of jointly selected programs and activities, and the integration into ESA missions at the level of principal investigator and researcher. The areas of PECS are space science; research and applications; telecommunications; micro-gravitation studies; engineering and land-use recovery. The scope of PECS includes technological equipment; scientific projects and / or experiments; use of data; and support for SMEs. The first tender in 2015 resulted to 19 submitted proposals and 5 approved projects, and the allocated funding was 20% to the industry and 80% to academic circles. Earth Observation received 38% of the funding; research and science 50%; and education 12%. For the ongoing second tender in the end 2016 26 proposals were submitted.


In response to a question, Mr. Komatichev explained that the Ministry cannot support financially scientific entities for publishing articles or participating in scientific events; it has dedicated financial support programs for SMEs only.

## GEO related activities in Bulgaria

Speaker: **Associate Professor Lyubka Pashova** – National GEO Office of Bulgaria

Associate Professor Lyubka Pashova, GEO Principal Alternate of Bulgaria, spoke about the membership of Bulgaria in GEO, focusing on its status and perspectives. She first presented the GEO and its societal benefit areas underlining the European context in them. She introduced GEOSS, including its vision and concept, and more specifically the challenges for Europe. She then outlined the status of Bulgaria as a member of GEO, starting with its acceptance and explaining the challenges, benefits and opportunities it offers for the country's development. Prof. Pashova provided details with regard to the activities carried out in the frame of the GEO initiative in

Bulgaria, the National GEO Office and its interaction with the public administration and the industry. She proposed a series of steps to surmount the challenges for Bulgaria; two of them being the inclusion in curriculums of BG universities of GEO, GEOSS and EO topics, and the launch of web portals (in the local language) for active promotion, e.g. by using all the media. She pointed out that one obstacle impeding larger inclusion in GEOSS is the lack of clear national policy for open data and their introduction in the GEOSS portal. Prof. Pashova concluded her presentation by underlining the important perspectives of GEO and GEOSS for Bulgaria.

## The activities of the Space Research and Technology Institute – Bulgarian Academy of Sciences

Speaker: **Professor George Sotirov** – Space Research and Technology Institute – Bulgarian Academy of Sciences (SRTI-BAS)


Professor George Sotirov introduced SRTI-BAS starting with its mission and history. He referred to the first attempts in space exploration by constructing instruments for ion/electron flows density observation followed by the year-long participation in the Inercosmos program with several instruments used by astronauts during short space missions as well as on-board Mir station. He highlighted the initial steps in EO in the missions of the two Bulgarian cosmonauts who used instruments produced by the engineering staff of SRTI in order to complete the foreseen scientific program initiated by a large international team of researchers. Special attention was put on the existing capabilities and the ongoing projects of SRTI for EO in-situ data provision (optical and passive microwave), satellite data processing and land use process modelling in the three departments. He mentioned that SRTI is taking part in ESA and H2020 funded projects as well as is often asked by the public administration to provide expertise in Space and EO issues.

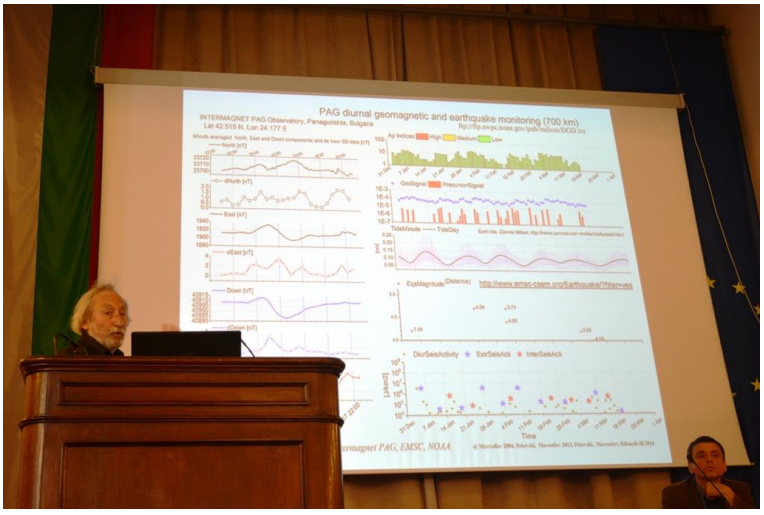
## Structure and activities of the National Institute of Meteorology and Hydrology – BAS

Speaker: **Professor Ekaterina Batchvarova** – National Institute of Meteorology and Hydrology – Bulgarian Academy of Sciences (NIMH-BAS)


Professor Ekaterina Batchvarova spoke about the history, the structure and the present scientific and operational activities at NIMH-BAS. Special attention was given to the priorities for scientific research of NIMH. She highlighted that NIMH is one of the main in-situ providers of meteorological, agrometeorological and hydrological data for water resources management and use at national level, and an official representative in several international organizations such as ECMWF, EUMETSAT, EUMETNET. Detailed description of the capabilities of the maintained permanent monitoring networks (meteo, hydrological, etc.) was given, along with information on the delivered products. The information on air quality was pointed out as one of the key end products resulting from the activities of NIMH since it includes the whole chain from monitoring via modelling to short-term prognosis and early-warning service. NIMH also deliveres information on extreme weather events such as heavy rains, strong winds or extreme wind waves using meteo models adapted at European level. Professor Batchvarova concluded her presentation mentioning that, in the framework of several European, international or bilateral projects, early warning systems for hydrology services have been developed and implemented.

## On the earthquake's prediction by the Institute for Nuclear Research and Nuclear Energy – BAS

Speaker: **Associate Professor Strachimir Cht. Mavrodiev** – Institute for Nuclear Research and Nuclear Energy – Bulgarian Academy of Sciences (INRNE-BAS)




Associate Professor Strachimir Cht. Mavrodiev concluded the scientific session with a presentation on the earthquake's prediction, in the framework of the FP7 project BlackSeaHazNet. He first spoke about the sun-moon tides in earth as triggers for earthquakes; then presented a forecasting system for weekly regional seismic activity which is based on monitoring of the geomagnetic field; and finally elaborated on the possibilities "when, where and how"

for earthquakes prediction. Professor Mavrodiev showed results from the BlackSeaHazNet project and suggested its continuation through the submission of proposals to NATO Science for Peace program and EU H2020 program under the broad topic EO data exploitation, reanalysis and modelling. It was emphasized that key factors for a successful proposal are a strong regional scientific team, as well as large computing and storage facilities.

## *Lunch break*

## Presentation from ESRI Bulgaria

Speaker: **Mr. Dimitar Koritarov** – ESRI Bulgaria


The afternoon session opened with the presentation of ESRI Bulgaria, one of the leading GIS companies in the country. Mr. Koritarov gave an insight of the new possibilities offered by the proprietary software and the projects realized over the last years. He provided an overview of the new GIS version that integrates desktop solutions with cloud services and mobile applications for field data acquisition from a variety of sources such as drones, GPS stations, LiDAR, etc. Mr. Koritarov put focus on the cloud data manipulation (e.g. solutions for photogrammetry processing) and smart products representation directly leading to WEB mapping, and thus improved collaboration and better decision making. Furthermore, options were shown for the seamless integration of scientific data and models such as the availability of supervised SVM classification based on different standards.

## Presentation from ReSAC Ltd.

Speaker: **Mr. Vassil Vassilev**– Remote Sensing Application Center – ReSAC Ltd.


In the presentation of the next GIS company, namely ReSAC Ltd., Mr. Vassil Vassilev provided details on the processing chain applied in order to deliver better geoinformation services and offer expertise to end-users. He mentioned the participation of ReSAC in several FP7 and bilateral EO projects and the know-how gained in the areas of agriculture, LC/LU mapping, forestry, environment, risk management, etc.. It was pointed out that thousands of thematic products in every area are delivered each year, both on project base and operationally. Mr. Vassilev underlined that one of the strengths of the firm is the close collaboration with national and local administration in developing methodologies and GIS geodatabases together with scientific organizations for geodata processing, targeting their specific needs.

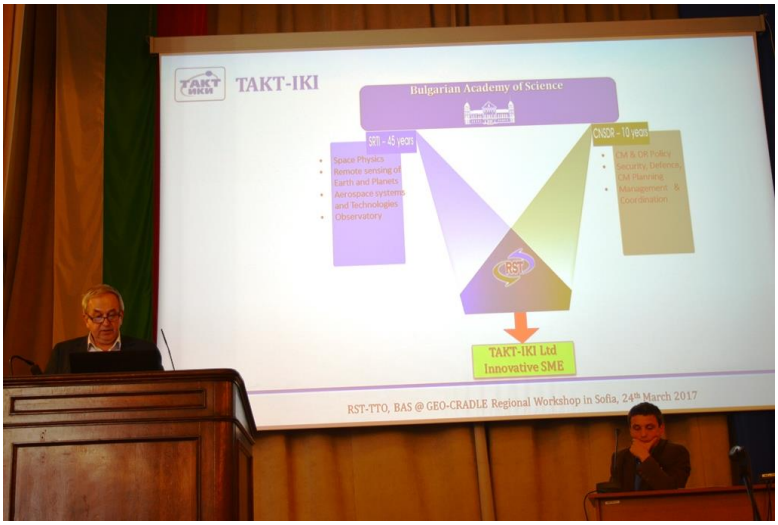
## Presentation from GeoCad-93 Ltd.

Speaker: **Mr. Milush Blagoev** – GeoCad-93 Ltd.

Mr. Milush Blagoev presented one more business entity: GeoCad-93 Ltd. He shortly introduced the capacity of the company and provided details on its activities in the areas of photogrammetry and 3D laser scanning; both of them being integral part of EO. He stressed that one indispensable instrument complementing the 3D laser scanning is the UAV drone, which is to deliver data on areas which are difficult to be scanned. Mr. Blagoev showed a large number of examples of precise model generation of ancient and modern buildings as well as of other archaeological or natural objects. This company was in charge to produce 3D model of one of the Bulgarian landmarks – the Alexander Nevski cathedral – and to introduce it in the European project. Other featured projects which were mentioned included the monastery of Kremikovtsi and the project "The four temples in the heart of Sofia", both of them gaining high recognition by the wide public. Finally Mr. Blagoev gave information on an ongoing project implementing laser scanning for the creation of virtual city models into which essential parts are the orthophoto and high precision textural DEM.

## Aero-space technologies for sustainable and secure environment

Speaker: **Mr. Kamen Iliev** – Risk Space Transfer (RST) Technology Transfer Office (TTO) - BAS




Mr. Kamen Iliev, Director of RST-TTO BAS, started his presentation by introducing RST and TAKT-IKI. He highlighted the successful establishment of RST office and TAKT-IKI Ltd, an innovation SME created following a contract of the National Programme "Competitiveness"-ERDF, as implementation of spin-off benefiting from the expertise accumulated in two scientific entities of BAS (SRTI & CNSDR). RST has executed 9 technology demonstration projects so far in 3 main domains: feasibility study and evaluation; marketing and certification; and testing and demonstration. TAKT IKI has implemented technology transfer projects in 3 main domains as well: mapping of natural disasters; mapping of anthropogenic hazards; and satellite images according to HR Image Acquisition Specifications for the CAP Checks (Cwrs). An important current project is the Earth Observation Monitoring For Better Water Management And Flood Prevention In Bulgaria (EMOWAF), financed under the 1st call of PECS ESA-BG. Mr. Iliev emphasized that one ambitious target for RST is to become National Sentinel Mirror Site delivering data and

products, given its webmapping and data archival capabilities, and thus to contribute to the improvement of the national potential in natural (e.g. harmful algae blooms, floods) and anthropogenic disaster management (e.g. industrial incidents).

## *Coffee break*

## Presentation of the thematic areas of the GEO CRADLE project pilots

Speaker: **Mr. Nikolaos Tsakiridis** – GEO-CRADLE Project Partner iBEC

Mr. Nikolaos Tsakiridis from iBEC, WP Leader for the GEO-CRADLE pilots & Regional Coordinator, presented the current implementation of the ongoing pilot activities in the four areas: 1) Adaptation to Climate Change, 2) Improved Food Security - Water Extremes Management, 3) Access to Raw Materials, and 4) Access to Energy. He showed the first results of the pilots, and introduced the end-users who are already interested and even involved in their implementation to cover their needs. Mr. Tsakiridis underlined that all the thematic areas of the GEO-CRADLE pilots are linked with the UN Sustainable Development Goals.

## EU funding possibilities – H2020 calls

Speaker: **Mr. Kristian Milenov** – Agency of Sustainable Development and Eurointegration (ASDE) (Bulgaria)

The last presentation was delivered by Mr. Milenov, CEO of ASDE, who presented the experience he obtained by acting as a key expert in harmonizing cross border data. He pointed out that the integration of Copernicus data and regularly updated in-situ data, following the requirements of ISO standards, FAO, LC/LU classification scheme, are the key factors in the creation of an effective land cover database at regional and national level. Mr.

Milenov proposed the creation of a pan-European trans-border resilience ring/net in order to maximize the impact of Copernicus data and products, utilizing the existing operational and research capacity, combined with high performance computing facilities and storage space available in several computing centers of the academic or other public entities. He emphasized that such an initiative will allow improvement of the operational capacity for regular monitoring of LC/LU for integrated risk and territory management focusing on statistical analysis and reporting, risk prevention, efficient use of EU funds etc..

## Discussion and wrap-up

Facilitator: **Mr. Lefteris Mamais** – GEO-CRADLE Project Coordination Team NOA


During the discussion **Mr. Vessellin Vassilev** took the floor as an official representative of the Cluster for Aerospace Technologies, Research and Applications (CASTRA). He pointed out that although Bulgaria has serious potential in EO data assimilation, processing, and products and solutions creation, as confirmed by all previous speakers, there is still long way to go in order to establish a stable and uniform local community. One of the obstacles mentioned is the lack of a national Space program adopted by the public authorities, resulting in weak ties between administration, research and industry. Mr. Vassilev also expressed his expectations that the available high performance computing facilities available at several Bulgarian institutions could contribute to EO data processing and establish a national archive with those data.

**Mr. Lefteris Mamais** concluded with summarising the GEO-CRADLE contribution: deliver a prototype methodology and a detailed assessment on EO maturity per country, define the regional priorities, implement 4 pilot activities supporting the EO market uptake and internationalisation, create and sustain a Regional Networking Platform of EO stakeholders and a Regional Data Hub with connection to GEOSS & Regional Portals, and submit to the EC a roadmap for the future implementation of GEOSS.

Mr. Mamais called all the relevant stakeholders to become part of the Networking Platform, and follow GEO-CRADLE. Finally he thanked SRTI and the participants for this very interesting workshop which provided valuable knowledge on the identified EO capacities and skills, as well as the regional needs and challenges.

## Closing remarks

Speaker: **Mr. Hristo Nikolov** – Space Research and Technology Institute (SRTI)

The workshop was closed by Mr. Hristo Nikolov who expressed his gratitude to all the speakers and attendees for this successful workshop.