HYRESSA Report Summary

Project ID: 26194
Funded under: FP6-INFRASTRUCTURES
Country: Belgium

Final Report Summary - HYRESSA (Hyperspectral Remote Sensing in Europe - Specific Support Actions)

The HYRESSA project aimed to move towards an improved access to hyperspectral data in Europe. The last few years several hyperspectral flight campaigns with different kind of sensors have been performed and next-generation European airborne hyperspectral sensors (APEX and ARES) are under construction.

The HYRESSA objectives were:
- to identify European providers and users of hyperspectral data and to build a database;
- to investigate the strengths, weaknesses, opportunities and threats (SWOT) of the field of hyperspectral remote sensing in Europe;
- to identify the European user needs of the hyperspectral remote sensing research community in terms of accuracy, quality, formats, protocols of and access to hyperspectral data;
- to explore strategies to build a European network of hyperspectral remote sensing facilities and to coordinate a future distributed European hyperspectral remote sensing research infrastructure and to investigate how to refine existing protocols in compliance with standards (cfr. EU initiative Inspire);
- to review existing protocols related to acquisition, calibration, processing of hyperspectral data and in situ measurements and to refine protocols in compliance with standards;
- to design a plan for future collaboration related to a distributed European hyperspectral remote sensing research infrastructure;
- to inform the hyperspectral remote sensing community about HYRESSA and to disseminate the results from the project.

In its first phase, HYRESSA identified European users and providers of hyperspectral remote sensing data and investigated the user needs of the European hyperspectral remote sensing research community with respect to access to hyperspectral data and products, and issues of accuracy, quality and conformity of hyperspectral imagery. This knowledge was gathered using a variety of methods, from a SWOT and user needs workshop, a questionnaire on user needs following the methodology of value-benefit analysis and an exploratory workshop.

In its second phase, HYRESSA evaluated strategies aimed at building a Europe-wide network of hyperspectral data providers and users and coordinating a user-oriented hyperspectral remote sensing research infrastructure. Furthermore, an overview of existing or foreseen protocols and standards with respect to data acquisition, campaign planning, calibration and validation, data processing, quality measures, distribution, and education and training was prepared and a number of key elements for refinement were identified and refinement proposed and performed.

Finally, HYRESSA identified based on the user needs all essential building blocks for a hyperspectral remote sensing research infrastructure and established a plan for future collaboration.

HYRESSA produced knowledge from the SWOT and user needs workshop, the evaluation of the questionnaire on user needs,
the exploratory workshop, the review and refinement of protocols is summarized below and was the basis for the work related to the future collaboration plan.

1. There is a clear and urgent need for an improved research infrastructure and for the strengthening of capabilities in hyperspectral remote sensing at a European level.
2. High quality European capabilities exist at national levels in all aspects of the key areas required for a hyperspectral research infrastructure (including ground instrumentation, calibration, validation, sensors and sensor development, product development and data delivery).
3. A research infrastructure would significantly enhance European-wide capabilities in hyperspectral remote sensing by ensuring existing expertise which is available to all EU Member States and in so doing reducing duplication, sharing and capacity building.
4. That such an infrastructure can be efficiently achieved through three lines of approach: facilities, protocols and mechanisms.

All HYRESSA partners agreed that a hyperspectral remote sensing research infrastructure has a unique character related to its relatively long processing chain ranging from sensor development and calibration to the final distribution of derived products to a broad range of specialised users interested in different application fields (e.g. ecology, limnology, geology).

The HYRESSA project has identified critical elements (hubs) which it considers are necessary for a hyperspectral remote sensing research infrastructure. These include: quality control, education and training, field capabilities, data management, modelling, future sensor development, data assimilation, spaceborne sensors, calibration and validation, airborne sensors. The overall aim of a HYRESSA project was to develop and maintain a pan-European research infrastructure to integrate, to build and maintain capacity in research in hyperspectral remote sensing technologies and to sustain and stimulate the use of hyperspectral data products.

The HYRESSA project was well-received by the European hyperspectral remote sensing community at the SWOT and user needs workshop, the exploratory workshop and the Fifth Earsel SIG IS workshop. HYRESSA encouraged further cooperation between the HYRESSA partners and other stakeholders and as a consequence will reduce duplications of effort and optimise the use of resources. Further information (reports, presentations and publications) can be found at the HYRESSA website: http://www.hyressa.net.

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Last updated on 2011-04-14
Retrieved on 2019-08-10

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