Centre for Atmospheric REmote Sensing and Space Earth observation

CARESSE

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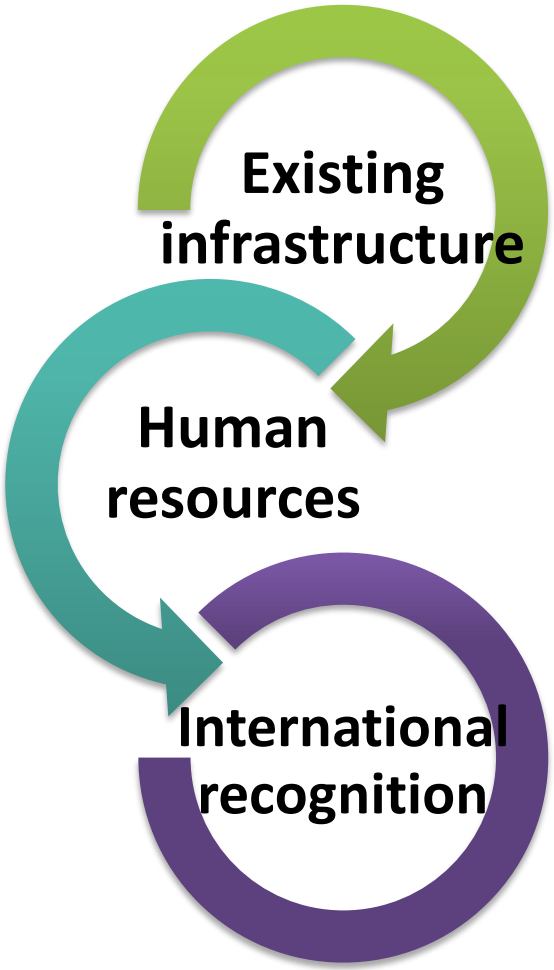
Project Overview

- **CARESSE** = an initiative to concentrate and organize existing capacities for atmospheric remote sensing in Romania, in order to become a relevant and competent partner for ESA's EO missions.
  - covers atmospheric composition and processes
  - participation in Ground Segment activities (e.g. validation of retrieval algorithms or products for Sentinels, EarthCARE and ADM-Aeolus, mission preparation, measurement technology, CAL-VAL, data exploitation)
- **General Objective** - to create a platform for collaboration between research and industry and develop new competencies in atmospheric remote sensing, relevant for EO programs.



Project Overview

Specific objective

- Create a sustainable high-quality research and training nucleus for atmospheric remote sensing in view of future EOEP-4 missions.
- Develop, organize and harmonize the existing scientific and technological capacities for space-related applications of atmospheric remote sensing.
- Adjust to the specific requirements of the European Space Agency and strengthening international collaboration

Improve Remote sensing database

– more automatic & continuous measurements

- ACSM (Aerosol Chemical Speciation Monitor)

Reinforce the human resource

- operation of the non-automatic lidars

- complex data analysis and

- elaboration of high-quality scientific publications

Networking activities

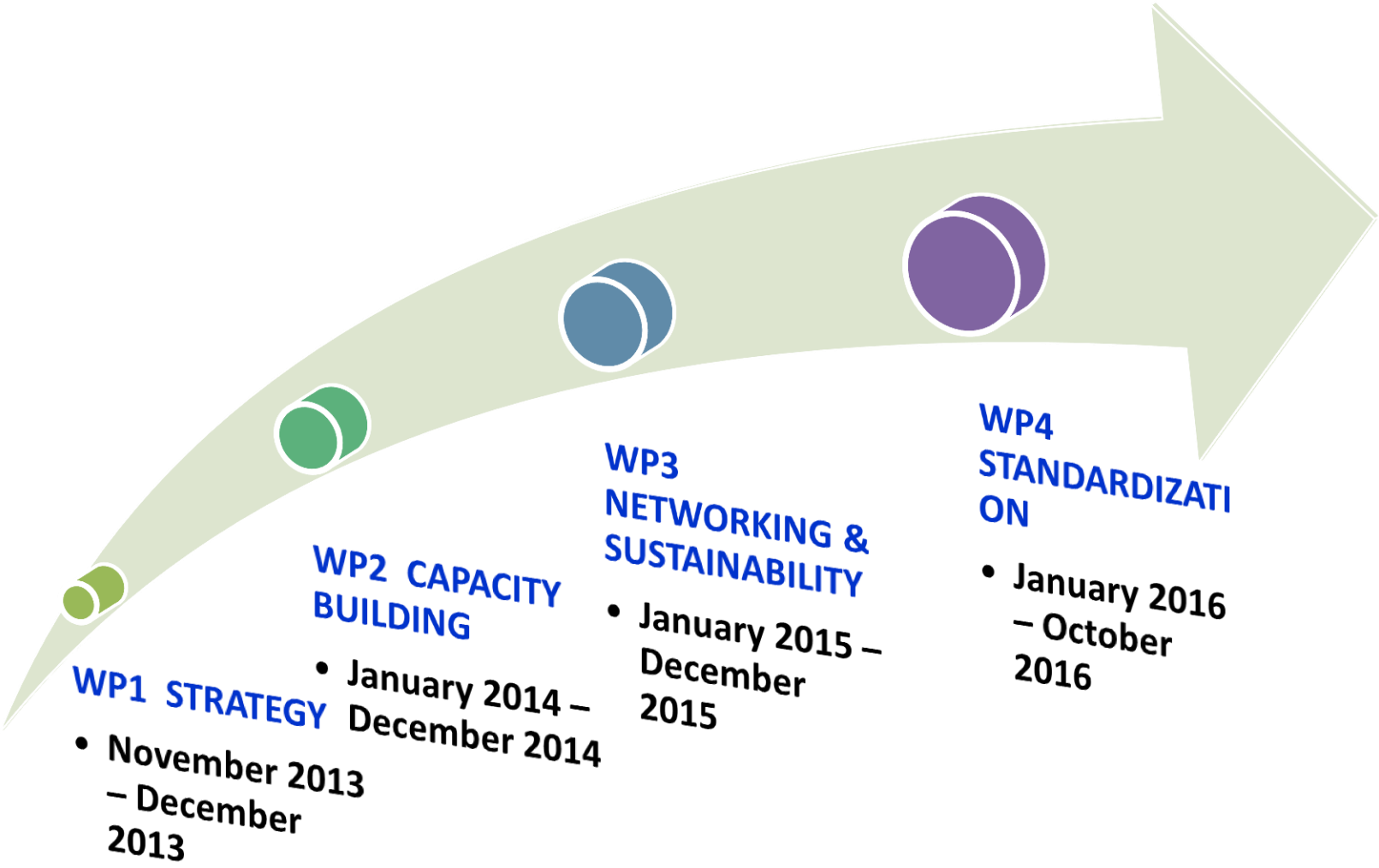
- cooperation agreements

- participate to Space related calls

- host master and PhD training activities

- dissemination

Timeline


WP1 STRATEGY
• November 2013 – December 2013
WP2 CAPACITY BUILDING
• January 2014 – December 2014
WP3 NETWORKING & SUSTAINABILITY
• January 2015 – December 2015
WP4 STANDARDIZATION
• January 2016 – October 2016

Expected results

Name	WP no.	Delivery month
Cooperation agreements	1	2
Medium-term development plan	1	2
Upgraded atmospheric remote sensing infrastructure	2	14
Remote sensing meta-database	2	14
Reinforced human resources	2	26
Master and PhD thesis	2	26
Exchange of expertise and know-how	3	26
Representation in ACTRIS, EARLINET and other relevant networks	3	26
Proposal submitted to ESA calls	3	26
Proposal submitted to national and/or international space-related calls	3	26
Scientific papers submitted to ISI journals	3	26
Communications to international conferences	3	26
People trained in using ECOS	4	36
IPR plan	4	36
Workshop proceedings	4	36

Human resources

CARESSE team member	Competencies and responsibilities
Dr. Doina Nicolae	Physicist, lidar, PROJECT MANAGER, WP1 leader
Dr. Camelia Talianu	Mathematician, programming, responsible with long-term sustainable development of the center
Dr. Jeni Vasilescu	Physicist, spectroscopy, WP3 leader
Dr. Eng. Anca Nemuc	Physicist, atmospheric physics, WP4 leader
Dr. Eng.Livio Belegante	Physicist, lidar , data processing, WP2 leader
Cristian Radu	Engineer, instruments, member of the team
Dr. Luminita Marmureanu	Biologist, data analysis, member of the team
Florica Toanca	Economist, PhD. st., marketing & publicity, member of the team
Dr. Simona Andrei	Physicist, meteorology, modelling &forecasts, New team member
Gabriel Dumitrache	Engineer, master st., algorithms, New team member

Medium-term development plan - SWOT analysis

Strengths

- **Infrastructure**
  1.State-of-the-art research infrastructure (see Annex), unique in SE Europe
  2.Access to international high-quality infrastructure, international and national data bases (EARLINET- ACTRIS, AERONET, ROLINET, RADO)
- **Human resources**
  1.Highly trained personnel, good scientific records
  2.Top quality, multidisciplinary expertise in: physics, optical and electronic engineering, mathematics, programming, biology, chemistry
  3.Young and in the same time experienced team, well motivated and competitive
  4.Good representation in international committees (EARLINET, ACTRIS), expert and coordination groups (ICLAS, EG-CLIMET, TOPROF), standardization groups (ISO)
- **Quality assurance**
  1.Implemented quality assurance programs, as data provider for international ground-based networks
  2.ISO: 9001/2008 certification
- **Visibility**
  1.Outstanding national and international networking
  2.Cooperation with the private sector and national administration
  3.Extended expertise in project management
  4.Dedicated marketing & publicity office
  5.Strong links with academia
  6.A leading position as the most advanced atmospheric remote sensing in Romania and SE Europe

Weaknesses

- **Resources**
  1.Insufficient funding to maintain and develop the existing infrastructure and human resources
  2.Lack of multiannual financial planning which leads to incoherencies in strategic development
  3.Insufficient human resources to handle non-automatic instruments, leading to limited participation in international campaigns
  4.Insufficient automation of data collection and data processing, leading to gaps in observational parameters
- **Visibility**
  1.Limited direct contact with partners due to the underfunding of travel for meetings
  2.Limited access to novel scientific findings due to the underfunding of travel for conferences and restricted access to documentation
- **Technological transfer**
  1.Low degree of technological transfer to industry, due to the specifics of the research (generating highly specialized products and knowledge, which are not immediately marketable)
  2.Low degree of co-financing from industry, due to the specifics of the research (with impact on general social needs, not specific to a certain economical sector)
  3.Weak participation to space-related programs, due to the relatively new domain in Romania
  4.Low degree of exposure to standardization, especially space standardization

Medium-term development plan - SWOT analysis

Opportunities

1. Increasing social interest towards the environmental and climate change issues, which leads to increase of funding for EO activities
2. Participation to ACTRIS, ITaRS, TOPROF, which may foster new partnerships and funding opportunities
3. Increasing Romanian contributions to ESA programs, which gives opportunities to approach new research directions and participate in ESA tenders
4. Increasing access to the global market through ICT;
5. Reorientation of research priorities according to the national strategy;
6. Transfer of knowledge and know-how from experienced European research organisations;
7. Brain circulation, which may foster the employment of highly qualified researchers from abroad (e.g. Romanians from abroad, young scientists from neighbouring countries, etc.)
8. Acceleration of inter- or multidisciplinary research;
9. Romanian membership to the EU and single market, even in research (ERA).
10. HORIZON 2020, with a strong applicative and innovative component

Threats

1. At national level, GERD is in constantly decreased (since 2008);
2. Brain drain towards more Western EU, USA and Canada which leads on short and long term on human capital loss
3. Strong national and international competition, especially between different research domains
4. Decreased interest from large corporations to grow by R&D as short term financial priorities are more important than long term ones
5. Limited number of calls for proposal to access funding
6. Lack of a program on institutional funding that should cover basic needs of research units
7. Warn out of the technology embedded in the existing research instruments
8. Lack of continuity in the general strategy for research in Romania

Medium-term development plan

- Increase the scientific and technological capacity of the Centre, by:

1. ***completion of laboratory, in situ and remote sensing instrumentation*** in order to:
   - increase the quantity of the datasets
   - increase the quality of the datasets
   - ensure a safer and quasi-autonomous operation
   - widening the area of possible applications
2. **development of personnel professional and complementary skills**, in order to:
   - increase the number of publications in peer review journals
   - enlarge collaboration with international scientific community
   - intensify absorption of funds for research
   - capitalize results by offering innovative services to various stakeholders

Medium-term development plan

- Development of expertise domain, partnerships and activities:

3. **establishment of strategic partnerships** in order to:
   - ensure the relevance (spatial and temporal coverage) of the data / services offered
   - ensure future development inside international networks
   - facilitate the transfer of knowledge and technology to the society
4. **partnerships development,** by:
   - organizing meetings with stakeholders
   - extending the network by including more institutions,
   - accelerating the involvement in existing and under development observation networks
5. **increase the capacity to participate to space programs**, by:
   - identifying and implementing relevant ECSS standards, and learning to use ECOS
   - elaborating an Intellectual Property development plan
   - c. identifying immediate and future opportunities to use the centre's infrastructure and expertise in space applications

Results

- 5-years **development plan** focused on two directions: (1st) the **growth of scientific and technological capacity of the cente**r and (2nd) the **development of expertise areas**, **partnerships and activities** that contribute to enhancing participation in ESA programs. The plan will be updated after each SC meeting.
- establishment of the **Steering Committee**. Members of SC are specialists with long experience in managing national and European projects.
- discussion of **activities plan** and **responsibilities** of each partner (formal signatures of the MoU by new parties, committing to the general scope of organizing, harmonizing and supporting the national infrastructure for atmospheric remote sensing)
- signing **cooperation agreements** with national institution to contribute to **ACTRIS** (Aerosols, Clouds, and Trace gases Research Infrastructure Network) Europe and **IAGOS** (In-service Aircraft for a Global Observing System) Europe
- acquisition of an additional research instrument: **Aerosol Chemical Speciation Monitor (ACSM**). The new equipment will be installed at the INOE's super site in Magurele for continuous measurements. Estimated delivery - June 2014.
- **Reinforcement of team work**. One new experienced researcher and one engineer have been employed. They already made the basic training in order to be integrated into the larger team of scientists and engineers working at CARESSE.

Thank you for attention !

Questions?

http://environment.inoe.ro/category/63/caresse