

STRATEGIC PLAN

2014-2017



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Introduction

The Strategic Plan of the Centre for Ecological Research and Forestry Applications (CREAF) for the 2014-2017 period is, like the previous plan, a management tool allowing for the definition of the centre's future challenges and leading its organization towards the proposed aims. Strategic lines described herein are intended to continue enhancing research excellence and improve the transfer, training, effectiveness and dissemination of created knowledge.

The design of the current Strategic Plan began with an **analysis of strategy** similar to the one for the previous plan, which aimed to analyze the Centre through different elements. First, the results of the previous Strategic Plan (2009-2013) were taken as a reference for the centre's current situation. This information was supplemented with two key elements: the International Scientific Committee's second assessment (for the 2008-2011 period), and the CERCA Committee's assessment, both of them carried out in October 2012.

The second assessment of CREAF on behalf of the International Scientific Committee was a week-long visit during which the committee received information about the different research lines through presentations and interviews with senior and postdoctoral researchers, predoctoral students and technical staff. With this information, the committee issued a report with a list of 15 recommendations. The report was delivered to the Director of the centre. At the end of the week, and with the presence of the International Scientific Committee, the CERCA committee's assessment was carried out. This committee delivered a second report to the Director of the centre.

Based on this information, the Director has led an analysis aimed at drafting this Strategic Plan, promoting participation, discussion and a final agreement among the different approaches of the centre. The first proposal of the Strategic Plan was discussed in several specific meetings of the management board and subsequently by the CREAM Board of Trustees. This document contains the final version of the plan, after including the amendments proposed by these governing bodies.

Introduction to CREAM

The Centre for Ecological Research and Forestry Applications (CREAF) is a public research consortium centre that was founded in 1987. Its partners are the Catalan Government (Generalitat de Catalunya), the Autonomous University of Barcelona (UAB), the University of Barcelona (UB), the Institute of Catalan Studies (IEC) and the Spanish National Research Council (CSIC). CREAM is a member of the CERCA institution (Research Centres of Catalonia), and it maintains a network of exchange and collaboration with several national and international centres. This materializes in joint projects, publications and training actions.

As stated in the Mission of the 2009-2013 Strategic Plan, CREAM is a public research centre in terrestrial ecology, analysis of the territory and global change pursuing excellence in knowledge generation, methodological development, innovation, transfer, training, and dissemination. CREAM aims to contribute to the knowledge, conservation and management of environment and territory, and to the adaptation to environmental changes acting as a bridge between the academic world, administrations and society, and creating opinion in their scopes of action.

Therefore, as it is reflected in the composition of its consortium, CREAM has a dual commitment: to conduct top-quality research, and to develop key tools to assist institutions in making decisions on environmental issues. At the same time, it is also committed to the dissemination of research results and tools in every area of society, — namely, scientists, managers and the wider public. This dual commitment was detailed within the previous strategic plan in four basic lines:

- The development of **quality research** in different fields of **terrestrial ecology**, and particularly in the four areas defined by the Strategic Plan: Biodiversity, Functional Ecology and Global Change, Forest Ecology and Fires, and Landscape Ecology and Geographic Information Systems (GIS).

- The development of a line of **knowledge transfer oriented to decision-making** for administrations, particularly in relation to the **adaptation to global change** in its many features, i.e. climate change and drought, change in land cover, environment pollution, fires, biological invasions, etc.
- The development of **products and services, especially in the context of Information Technologies (IT)**, with SIG MiraMon and several environmental information systems—SIBOSC, SIPAN, EXOCAT—as their core values.
- The **dissemination of research results** to the different groups involved, from other researchers to administration staff, businesses and the general public.

CREAF currently employs 40 researchers from different public institutions under diverse forms of collaboration. It features a stable core of researchers and technical staff from CREAM itself, along with professors from UAB and UB, and researchers from CSIC and ICREA affiliated to the centre. It also has associate researchers from other centres, such as CTFC or UCM. All of them are good examples of the possible cooperation among institutions in joint projects and activities with common goals. CREAM staff has gradually increased since the beginning, even though the number of members has fluctuated around 130 people in the course of the last Strategic Plan. The most relevant contributions made during the period this plan was in effect (2009-2013) were:

- The publication of nearly 540 scientific articles in journals included in *Science Citation Index*, 145 of them published in 2013.
- The development of 180 projects, 75 in national public calls and 14 in international public calls, and 91 agreements and contracts.
- The participation in 13 European research programs.
- The training of 42 new doctors, both Spanish and foreign.
- The recognition of 6 consolidated research groups by AGAUR.

- The development and consolidation of several tools and databases directly applicable to the management of territory and environment, such as SIG MiraMon, multiple environmental information systems and different editions of land cover maps.
- A very high presence of the centre in the media and social networks, with more than 500 media appearances and nearly 20,000 followers of its digital communication channels.

CREAF Activity Report for the 2009-2013 period

The activity report of CREAF for the 2009-2013 period includes a series of indicators related to the activity of the centre and the available resources to carry it out, extracted from its annual reports.

a) Human Resources

CREAF staff has been composed of around 130 people over the past 5 years. Depending on their professional category, there has been a moderate increase in the number of senior researchers (basically due to consolidations at UAB and CSIC) and postdoctoral researchers, the number of predoctoral students and administrative staff has reached a plateau, and there has been a decrease in the number of technicians after the peak reached during 2011 and 2012 (Table 1).

Table 1. Human resources at CREAF during the 2009-2013 period.

Professional category	2009	2010	2011	2012	2013
Researchers	32	33	36	38	40
Postdoctoral	8	8	8	13	12
Predocctoral	27	29	30	27	30
Technicians	36	37	50	50	33
Administration	12	12	12	13	12
TOTAL	128	132	143	147	127

Personnel financed by CREAF's operational resources comprise eleven researchers and twelve members of administrative staff. Postdoctoral, predoctoral and technical staff is

financed through external competition, with differing durations depending on each project and competition.

Researchers at CREAF are contractually bound to five different institutions: CREAF itself, UAB, UB, CSIC and ICREA (table 2). CREAF also has four associate researchers from three different institutions —CTFC, UCLM and UCM.

Table 2. Institutional affiliation of CREAF researchers.

Institutions	2009	2010	2011	2012	2013
CREAF	10	10	12	12	11
UAB	16	17	18	19	14
UB	2	2	2	2	3
CSIC	4	4	4	5	6
ICREA	-	-	-	-	2
CTFC	-	-	-	-	2
UCLM	-	-	-	-	1
UCM	-	-	-	-	1

With reference to the research areas defined in the 2009-2013 Strategic Plan, researchers at CREAF are distributed as follows (Table 3):

Table 3. Distribution of researchers according to their main research area (2013).

Main area	Researchers
1. Biodiversity	13 (6 UAB, 3 CREAF, 2 CSIC, 1 CTFC, 1 UCLM)
2. Functional ecology and global change	14 (2 UAB, 3 CREAF, 3 UB, 4 CSIC, 2 ICREA)
3. Forest ecology and fires	9 (4 UAB, 3 CREAF, 1 CTFC, 1 UCLM)

4. Environmental analysis of the territory and GIS	4 (2 UAB, 2 CREAF)
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b) Publications

The scientific output of CREAF has increased substantially during the last five years, with an increase of more than 40% in articles published in journals included in SCI (Table 4). This increase is mainly due to (i) a significant improvement in the overall productivity of researchers and (ii) additional contributions of researchers recently associated to the centre. Regarding the quality of publications, it is worth noting that more than two-thirds of the articles have appeared in journals in the first quartile of the corresponding thematic categories:

Table 4. Number and impact of articles published in journals included in SCI.

Indicator	2009	2010	2011	2012	2013
Scientific articles in SCI journals	84	89	98	123	145
SCI publications / researcher	2.6	2.7	2.7	3.2	3.6
Total number of citations of CREAF articles	1778	2161	2855	3418	4098
% of articles in the 1 st quartile	56%	72%	63%	74%	65%
Average impact factor	3.8	3.1	3.1	3.9	2.3

The thematic categories of published works are very diverse, mainly in the *Ecology*, *Forestry* and *Plant Sciences* categories (Table 5).

Table 5. Thematic categories* of articles published by CREAF researchers between 2009 and 2013.

Category	Number of articles	%
ECOLOGY	181	37.4
FORESTRY	57	11.8
PLANT SCIENCES	57	11.8
ENTOMOLOGY	38	7.9
ENVIRONMENTAL SCIENCES	38	7.9
MULTIDISCIPLINARY SCIENCES	23	4.8
GEOSCIENCES, MULTIDISCIPLINARY	15	3.1
SOIL SCIENCE	11	2.3
METEOROLOGY & ATMOSPHERIC SCIENCES	10	2.1
REMOTE SENSING	7	1.5
ZOOLOGY	8	1.7
WATER RESOURCES	6	1.2
ORNITHOLOGY	5	1.0
OTHER	28	5.8

*Categories according to ISI Web of Knowledge.

Unlike SCI articles, the number of publications in non-indexed journals, book chapters and books does not follow an increasing trend but fluctuates from year to year (Table 6).

Table 6. Scientific articles in non-indexed journals and other publications.

Publications	2009	2010	2011	2012	2013
Articles in non-SCI journals	9	21	12	34	9
Book chapters	17	18	22	7	25
Books ^a	4	8	7	-	5

^a Published by CREAM, or whose authors, coauthors or editors are researchers at CREAM

c) Funding

The number of projects and agreements fulfilled annually shows a variable pattern during the 2009-2013 period, oscillating between 26 and 43 (Table 7).

Table 7. Number of competitive projects and agreements for activities of transfer and development.

Project type	2009	2010	2011	2012	2013
Competitive					
<i>Spanish calls</i>	11	18	11	12	7
<i>Catalan calls</i>	6	1	3	6	0
<i>International calls</i>	1	5	1	0	7
Non-competitive					
<i>National</i>	15	9	10	21	22
<i>International</i>	2	2	1	2	7
TOTAL	35	35	26	41	43

Funds obtained during 2009-2013 through projects and agreements represent more than 10 million €, well above the resources received by CREAM from the *Contracte Programa* of the Catalan Government (Table 8).

Table 8. Resources obtained through different types of competitive projects and agreements. For comparative purposes, the last row shows the funding received through *Contracte Programa*, including operational resources and resources for specific projects.

Project type	2009	2010	2011	2012	2013	TOTAL
Competitive	(Sums expressed in €)					
<i>Spanish competitions</i>	931,255	1,253,526	743,300	1,040,483	132,762	4,101,329
<i>Catalan competitions</i>	263,874	3,120	92,405	221,110	0	580,510
<i>International competitions</i>	96,000	1,433,033	100,000	0	2,045,533	3,674,567
Non-competitive	(Sums expressed in €)					
<i>National</i>	388,318	207,873	134,072	392,481	452,225	1,574,970
<i>International</i>	6,200	4,583	38,861	5,910	58,627	114,182
TOTAL Projects (€)	1,685,647	2,902,136	1,108,640	1,659,985	2,689,149	10,045,560
<i>Contracte Programa with the Catalan Government (€)</i>	1,322,554	1,523,000	1,267,221	1,324,963	1,054,567	6,492,306








d) Attraction of European Funds

In 2011 the **CREAF Department of European Projects** was launched. It is divided into three units (Fund Attraction, Communication, Administration and Management) that work together with the researchers from the centre, seeking funding

opportunities for R&D&i projects. The launch of this department has enabled the development of a **proactive model** of participation in proposals for the European Framework Programme. This model started to bring results in 2013 (Table 8).

Apart from increasing the involvement of CREAF in European projects, the creation of the Department has enhanced the **visibility and promotion of the centre abroad**, by means of the active participation in events and new EC initiatives in some of the expertise fields of CREAF, such as the geospatial field, forests and water (Table 9). These initiatives enable the early involvement of CREAF in many EC project proposals.

Table 9. Involvement of CREAF in initiatives promoted by the EC.

European initiative	Area	
EGU - Earth and Space Science Informatics division (presidency)	Geospatial	
CEN/TC 187	Geospatial	
OGC – European Forum on geospatial standards	Geospatial	
European forest platform (Forest based technological platform)	Forest	
EIP raw materials	Forest	
EIP water	Water	
European platform for water (WSSTP)	Water	

e) Training

One of the main activities of CREAM in this area is the **training of new researchers** through PhD and master's programs, and the supervision of graduate theses. During 2009-2013, CREAM consolidated a **PhD Program in Terrestrial Ecology**, awarded with the **Mention towards Excellence** for the 2011-2014 period. This mention is awarded by the Spanish Ministry of Economy and Competitiveness and only 10% of all Spanish PhD programs have received it, of which only two are in ecology. Thanks to the creation of this new PhD program, the number of predoctoral students at CREAM has remained around thirty people per year for the last five years. This represents a significant improvement compared to the 2004-2008 period (around 20 per year; Table 10). This has also meant an increase in the number of graduate theses defended annually: from 5.4 to 8.4 (PhD); from 12.6 to 17.8 (master's; Table 10). Regarding the recruitment of junior researchers, the number of postdoctoral contracts per year has also improved significantly (from 2.8 to 8.2) compared to the previous period (Table 10).

Table 10. Training activities.

Activities	2004-08 average	2009	2010	2011	2012	2013
PhD theses	5,4	5	9	5	15	8
Master's theses	12,6	18	17	19	18	17
Predocctoral students	21,2	27	29	30	27	28
Postdoctoral contracts	2,8	8	8	8	13	4

It is also important to highlight that two UAB masters' degree are taught by many professors and researchers from our centre: the **Master in Terrestrial Ecology and Biodiversity Management**—science-oriented—and the **Master in Remote Sensing and Geographical Information Systems**—technology-oriented.

f) Knowledge Transfer

Besides providing basic scientific knowledge about the operation and evolution of terrestrial ecosystems, the research carried out by CREAM generates information and methodological tools in different areas to improve the planning and management of the environment. Knowledge and products are transferred to different public administrations to help forest managers and technical managers in decision-making or priority assignment.

Table 11 details some of the most prominent tools developed by CREAM in recent years:

Table 11. Main tools developed by CREAM during the 2009-2013 period.

Years	Product
1994-present	MIRAMON Geographic Information System (GIS) of Catalonia
1995-present	SIPAN Natural Heritage Information System of Catalonia
1994-2012	MCSC Land cover map of Catalonia, high resolution
2012-present	DEBOSCAT Pioneering tool in Europe to obtain information on forest health
2012-2013	EXOCAT Key tool to enhance prevention and control strategies of biological invasions in Catalonia
2012-2013	RESTOCAT Protocol to evaluate the restoration of extractive activities
2013	CANVIBOSC Report of vulnerability of forest species to climate change

In addition, CREAM performs several activities to spread research and management, and to raise awareness in public opinion about environmental issues about which information is usually contradictory or confusing. Among these activities it is worth pointing out the annual organization of conferences with ICHN and SCB, subsidiaries of IEC, and several technical transfer workshops (Table 12). Since 2012 CREAM has been involved in the Annual Technology Transfer Plan (PATT) of the Department of Agriculture of the Government of Catalonia, which has provided financial and logistic resources to hold such seminars.

Table 12. Number of conferences and workshops held by CREAM during the 2009-2013 period.

Indicator	2009	2010	2011	2012	2013
Organization of conferences and workshops	2	10	10	13	12

g) Communication

Since 2011 CREAM has had a Communication Department consisting of a manager and a technician. This has brought a very important qualitative and quantitative leap when it comes to the dissemination of the research results of the centre (Table 13). Since its creation the impact of our centre's research on the mass media has increased significantly, and digital communication tools with thousands of visits have been created, as well as an electronic newsletter with more than 1900 subscribers.

Table 13. Appearances in and impacts on different activities of communication.

Indicator	2009	2010	2011	2012	2013
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Press releases	3	4	12	29	21
Impacts on mass media	88	56	130	139	105
Blog visits	-	-	-	11,942	15,871
Twitter followers	-	-	-	1,223	2,700
Newsletter subscribers	-	-	1,479	1,620	1,906

h) Scientific Output of CREAF Researchers by Institution

Table 14 shows the scientific output of our researchers classified by their institution of origin (CREAF itself, UAB, CSIC and UB). Figures indicate the total number of items with one or more researchers from each institution.

Table 14. Scientific output of researchers from other institutions affiliated to CREAFa.

Items	2009	2010	2011	2012	2013	Total for 2009-2013
SCI articles						
CREAF researchers	31	23	40	28	35	157
UAB researchers	34	23	25	63	53	198
CSIC researchers	15	20	25	26	32	118
UB researchers	5	3	3	1	3	15
Other publications						
CREAF researchers	6	19	12	13	11	61
UAB researchers	47	39	38	26	19	169
CSIC researchers	23	14	8	6	14	65
UB researchers	4	9	2	1	11	27

PhD theses supervised						
CREAF researchers	2	4	2	2	1	11
UAB researchers	3	4	4	3	7	21
CSIC researchers	2	0	1	2	2	7
UB researchers	0	0	0	0	0	0

Master's theses supervised						
CREAF researchers	5	6	4	7	3	25
UAB researchers	5	5	2	1	9	22
CSIC researchers	2	0	3	3	2	10
UB researchers	2	0	1	1	2	6
Involvement in projects						
CREAF researchers	33	37	42	36	43	191
UAB researchers	49	51	42	36	35	213
CSIC researchers	17	14	16	10	13	70
UB researchers	7	11	10	6	6	40
Media Impacts ^b						
CREAF researchers	23	25	58	69	71	246
UAB researchers	29	19	72	81	65	266
CSIC researchers	33	20	18	20	15	106
UB researchers	8	3	6	8	5	30

^a The scientific output of the only researcher from ICREA in our centre is not included, since he joined in mid 2012 and CREAM does not appear in many of his contributions.

^b Shows/news involving researchers affiliated to CREAM or reporting activities of CREAM.

Analysis of the Centre

The development of this Strategic Plan begins with the Analysis of the Centre, with the following goals: (i) assess the current state of research and the internal organization of CREAM; (ii) define the challenges for the next four years; and (iii) write and implement the goals and actions of the 2014-2017 Plan. This analysis has been carried out by members of CREAM and independent bodies (the CERCA committee and the International Scientific Committee) on the basis of the following items:

- a) Compliance with the 2009-2013 Strategic Plan.
- b) Independent Assessment conducted by the International Scientific Committee.
- c) Independent Assessment conducted by the CERCA Committee.
- d) SWOT analysis.

a) Compliance with the 2009-2013 Strategic Plan

A thorough analysis of CREAM's previous strategic plan (2010-2013) has been performed to establish its compliance level. CREAM's compliance with the different actions included in the multiple strategic goals of the strategic plan's three main lines is detailed below.

Line 1: Research.

Strategic goal 1.1 The development of excellent, innovative and cutting-edge research, with potential to become a benchmark at both a national and an international level.

Although the execution of some actions involving high costs has been hindered by the global financial situation, the level of compliance with this strategic goal has been fairly high.

Anticipated actions and level of compliance:

- 1) *To create an independent advisory committee at an international level.* A committee consisting of four world-renowned international scientists has been created.
- 2) *To recruit senior scientists of maximum excellence.* An ICREA researcher and a CSIC researcher have been recruited. A stable relationship as associate researchers has been established with different researchers of other institutions.
- 3) *To recruit and consolidate junior researchers of renowned value.* Two researchers from Ramón y Cajal Program have been consolidated.
- 4) *To create research premiums for researchers.* Research premiums for researchers—more demanding than those of other public institutions—have been defined to enhance the positioning of CREAM at a national and an international level.
- 5) *To offer bonuses for quality research to researchers affiliated to CREAM.* The current financial situation has not allowed the offering of bonuses to CREAM researchers.
- 6) *To incorporate support staff to research.* Two support technicians have been consolidated: a technician in modeling and statistics, and an IT technician. Due to the unfavorable financial situation, the latter is not going to be hired from 2014 onwards.
- 7) *To provide a fund to encourage the arrival of postdoctoral and research visitors.* The provision of a fund to encourage the visit of postdoctoral

researchers and professors has not been possible. However, this has been achieved through public calls.

- 8) *To provide a fund to promote stays abroad among CREAF staff members and the presence of researchers from our centre in national and international committees.* The provision of a fund to promote research stays abroad for researchers has not been possible.
- 9) *To monitor the needs and potentials of the centre's priority research lines.* A preliminary follow-up of the needs and potentials of the centre's priority research lines has been made. However, the allocation of significant resources for specific needs of these lines has not been possible.
- 10) *To carry out applied research and development projects related to the mission of the centre.* Applied research and development projects related to the mission of the centre have been carried out.

Line 2: Training, knowledge transfer and communication.

Strategic goal 2.1 The promotion of high level scientific training.

This strategic goal has a compliance level of 100%.

Anticipated actions and level of compliance:

- 1) *To create a PhD program.* A CREAF-specific PhD program in Terrestrial Ecology has been created.
- 2) *To promote the production of doctoral theses.* During the last five years the number of predoctoral students and doctoral theses defended has increased (see Table 10).
- 3) *To organize and teach master's degrees and postgraduate programs.* CREAF is involved in the teaching and organization of several master's and postgraduate programs (see Training section).

Strategic goal 2.2 The enhancement of the transfer of knowledge and tools.

The level of compliance with this strategic goal is high, since many of the activities for the transfer of knowledge and tools have increased substantially:

Anticipated actions and level of compliance:

- 1) *To organize scientific symposiums.* The organization of scientific symposiums has greatly increased, as shown in Table 12.
- 2) *To prepare transfer workshops and symposiums with administrations and managers.*
- 3) *To organize and teach specialized courses.*
- 4) Similarly, a significant number of workshops and specialized courses have also been organized. This has been achieved, in part because CREAM is involved in the Annual Technology Transfer Plan (PATT) of Department of Agriculture of the Government of Catalonia.
- 5) *To enhance the accessibility of CREAM's data servers, reports and tools.* Different tasks (such as installing servers and improving data access) have been performed to enhance the accessibility of administrative technicians or managers to the data.
- 6) *To find ways to exchange information between technicians and administrations.* Steps to improve the exchange of information with technicians and administration have been taken more recently.
- 7) *To issue an electronic newsletter including CREAM's major developments and results.* CREAMForum newsletter in its original format was periodically issued, until it was decided that it would be exclusively digital, as it is now.

Strategic goal 2.3 The promotion of the visibility of the centre among scientists, administrations and society.

This is one of the strategic goals with the most significant progress recorded.

Anticipated actions and level of compliance:

- 1) *To hire a communications manager.* A communications manager was hired in 2011 through a public competition with more than 600 candidates.
- 2) *To design and implement the Communication Plan of the centre.* The first function of the communication manager was to define the Communication Plan of the centre, introduced in 2011. Since then, the development of the Plan has been very satisfactory. Among other things, the presence of CREAM in the media has increased significantly, the attendance at symposiums has also increased and there are plans for positioning the CREAM brand at a national and an international level. In this sense, the presence of CREAM in the newspapers, the radio and the TV has grown during the five years of the plan's duration. The use of information technologies, such as social networks, has been implemented, with a large number of followers on Twitter and a remarkable increase in blog visits.

Line 3: Resources and organization of the centre.

Strategic goal 3.1 The development of a strategy for the centre's growing and investment.

Anticipated actions and level of compliance:

- 1) *To maintain and consolidate the centre's current funding sources.* Although some quite emblematic projects have been developed, such as CONSOLIDER Montes or GeoViqua (from the 7th European Framework Programme) and 6 quality research groups (SGR) have been recognized in the last competition of the Catalan Government, it is worth pointing out that it has been difficult to maintain and consolidate current funding sources, since contributions of the Catalan Government, competitions of the Ministry of Education, Culture and

Sports and projects with local organizations has been drastically reduced due to the current financial crisis. For this reason, the Department of European Projects was created, and a manager responsible for attracting funds was hired. This manager was experienced in research management within the European framework and acquainted with the dynamics of public competitions. Results have been successful and they are expected to grow in the future (see Attraction of European Funds section).

- 2) *To network with ministries, provincial councils, county councils, city councils, other departments of the Catalan Government, foundations and other public and private institutions financing R&D projects.* A Service for the Attraction of Private Funds was created. Networking with several companies was started, introducing different projects eligible for such funding. Despite the collaboration of some independent staff experienced in this environment, results have not been satisfactory due to the fragile financial situation of many businesses.
- 3) *To collect resources to build a new building in order to increase available areas in accordance with new goals and needs.* An analysis of immediate and future space needs for the centre was made, although the recent economic situation slowed staff growth and relieved the need for more areas. First, the building of a new floor on the current building was discarded, due to architectural reasons. The building of a new building was also discarded, due to the current economic situation. Currently there are plans for carrying forward the Can Balasc project, which would provide CREAM with more areas (laboratories, offices and meeting rooms) in the near future.
- 4) *To promote a network of permanent plots in Catalonia to study biodiversity, forest dynamics and global change.* So far a network of permanent experimental plots has not been consolidated, although the first one has been established at Can Balasc. Some researchers at CREAM also participate in the international network of LTER plots —long term follow-up plots.

- 5) *To get involved in the exploitation of experimental stations of la Castanya and la Cerdanya.* CREAM has so far maintained the exploitation of the experimental station at la Castanya. However, it has not participated in the station at la Cerdanya, as the owner (the city council of Bellver de Cerdanya) has decided to change its strategy and not cede the management to CREAM.

Strategic goal 3.2 The establishment of a functional structure and internal management for the centre focused on efficiency and optimal labor relations.

Anticipated actions and level of compliance:

- 1) *To hire a manager.* In 2010 a manager was hired through a public competition and a strict selection process.
- 2) *To perform a regular audit on the management and administration of the centre.* Different administrative tools were launched. At the same time, processes have been created and updated to improve the management of the centre.
- 3) *To sign agreements for UAB, UB and CSIC staff to be affiliated to CREAM.* Agreements to affiliate staff from UAB, UB and CSIC to CREAM have been signed. CREAM researchers have been acknowledged as *Researchers linked to universities (IVUs)*.
- 4) *To produce a greening plan for the centre.* The only negative aspect within this strategic goal is the greening plan, as it has not been produced yet.
- 5) *To plan and perform annual training courses for staff.* Between two and four in-company training courses have been performed per year. They averaged 160 hours per year. Nearly all of these courses have been funded with external funds.

b) Independent Assessment conducted by the International Scientific Committee

During October 2012, the CREAM **International Scientific Committee** performed the **assessment of the centre**. The committee was made up of four world renowned scientists; Dr. Josep Canadell (Global Carbon Project, CSIRO, Australia), John Grace (University of Edinburgh, United Kingdom), Robert Jackson (Duke University, USA), and Ivan Janssens (University of Antwerp, Belgium). The assessment included a week-long visit during which the committee met with different representatives of the main lines of the centre and interviewed senior and postdoctoral researchers, predoctoral students, technical staff and administrative and services staff. The executive summary of the committee's report considers that CREAM conducts research of great quality. It also includes the following recommendations:

- 1) To develop a new scope and new goals for CREAM in order to link the research carried out to the broad range of social benefits obtained as a result of this research.
- 2) To develop a set of global research questions leading to the definition of CREAM's main research topics. They should be included in the new Strategic Plan.
- 3) To establish a scientific committee within CREAM to boost in-house discussions on future research priorities.
- 4) To prioritize one or more specific fields of research in which CREAM wants to become an international leader and promote strategic investment to achieve this goal.
- 5) To use, as far as possible, open public competitions as a process to hire new research staff, and align the new growth with the priority fields of research.

- 6) To continue developing a clear management structure, defining professional levels and the path to promotion (stages and evaluation) for all technical staff, including an annual meeting with their boss.
- 7) To continue developing national and international networking, including the industry as a key element to fulfill CREAM's obligations regarding transfer of knowledge.
- 8) To launch one or two integrating research projects taking advantage of the multidisciplinary approach of CREAM and its partners. To align these proposals to face current socially relevant challenges.
- 9) To foster investment and/or alliances in order to boost the use of models as part of CREAM's efforts of to scale processes to basins, regions and the planet, including a repositioning of GOTILWA.
- 10) To increase the use of remote sensing as a key tool to boost the scale and evaluate changes in biogeochemistry and the structure and function of landscapes.
- 11) To keep enhancing the involvement of MiraMon in the research projects of CREAM and to commission a viability study to determine whether this GIS can become a sustainable spin-off.
- 12) To establish a number of weekly seminars where CREAM staff and guest researchers present and discuss research in a positive and collective fashion.
- 13) To establish a weekly meeting, with a social approach, either linked to the seminars or independent, to promote social interactions and collaboration among CREAM staff.
- 14) To boost the diversity of permanent research staff by increasing the number of women and international researchers.

- 15) To establish a fund for travelling to ensure that PhD students who are not supported by important projects also have the chance to travel abroad to attend conferences and visit other research institutions.

Annex 1 contains the full report of the International Scientific Committee.

c) Independent assessment conducted by the CERCA Committee

On October 25th, 2012, and with the presence of the International Scientific Committee, the assessment of CREAM on behalf of the **CERCA committee** was carried out. This is a compulsory assessment according to the National Pact for Research and Innovation, which states that all research centres in Catalonia must undergo a **regular assessment of their activities and strategies**. The committee was formed by scientists, technicians and managers: David Badia (Centre for Genomic Regulation, Catalonia), Josep Canadell, (CSIRO, Australia), Elena Canetti (4innovation, Israel), John Grace (University of Edinburgh, United Kingdom), Robert Jackson (Duke University, USA), Ivan Janssens (University of Antwerp, Belgium), Victoria Ley (Agencia Nacional Antidopaje, Spain), Joandomènec Ros (University of Barcelona, Catalonia), Lluís Rovira (CERCA, Catalonia), and David Fernández (General Management of Research, Catalonia). After the presentation of the director of CREAM and the subsequent discussion with the members of the commission, the CERCA committee met and wrote a report detailing its view of the centre and a list of recommendations.

The following is a list of the main conclusions and recommendations of the CERCA committee:

- 1) Regarding scientific output, CREAM has undergone an outstanding since its last assessment in 2008. CREAM possesses an adequate combination of research profiles, with more than a dozen internationally renowned, prestigious and

high-profile scientists. The CERCA committee highlights the scientific activity of Dr. Peñuelas. Notwithstanding this, CREAM's positive evolution has not led to its positioning among the best European research centres within its field. Efforts should be made to reach this goal. The CERCA committee also recommends focusing research on CREAM's best groups, without giving up applied research.

- 2) CREAM has greatly succeeded in obtaining funds from Spanish public competitions has been very successful (85%). However, at an European level, the centre has only been involved in three projects in recent years, being the coordinator only in one of them. Additionally, CREAM researchers have not been rewarded with projects granted by ERC. Since diversifying funds has been identified as one of the main priorities for 2009-2013, in recent years CREAM has intensified the number of activities aimed at the internationalization of financing, especially at the 7th European Framework Programme. The CERCA committee recommends increasing this effort in the near future. As regards the contributions from service contracts, most of them come from the public administration. This poses a serious risk in current times. The CERCA committee recommends increasing contacts with the private sector.
- 3) The transfer of knowledge to public bodies for the definition of policies is working very well, according to the original mission, but CREAM should enhance the transfer of knowledge to the private sector or industry. The CERCA committee recommends setting up a strategy to check systematically the commercial potential of CREAM's results and putting efforts into direct marketing aimed at private companies, maybe by hiring an appropriate professional trained in business development and transfer of technology. Companies may be interested in ecology, climate change, forests, and so on. CREAM facilities, as a qualified service, could be used by or shared with external users. CREAM's own policy regarding intellectual property should be defined in order to establish conditions of intellectual property, use of knowledge and grant of licenses to private companies or their transfer to spin-off companies. This document must be shared and discussed with the scientific staff.

- 4) CREAF's strategy for hiring researchers includes an interview with the candidate and a management assessment before the final decision is taken. The CERCA committee recommends the application of competitive processes for selecting new candidates, including the possibility of an independent assessment (for instance, with the participation of the International Scientific Committee) to hire the best scientists. The proportion of foreigners in the centre is 12%. The value is considered low, as is the ratio of women researchers. The CERCA committee recommends that CREAF take significant steps to eliminate any barrier against a more diverse composition of its research staff. The CERCA committee also observes that the salary structure in the centre is conservative and it recommends some degree of flexibility, with incentives based on fulfilled production. PhD students should have special support, regardless of their research group, to ensure their opportunities of mobility, attendance to workshops, and so on. Technicians are very motivated and their qualifications and skills are impressive. Currently, most of them are paid via projects (despite having permanent contracts) and their professional level is unclear, divided only in three categories. The CERCA committee recommends defining those categories more clearly, to obtain a higher degree of transparency in their promotion, salary, professional level, and so on.
- 5) As for the management policy of the centre, the CERCA committee concludes that it has different sources of income: CREAF obtains approximately 2 additional € for every euro contributed by trustees to the budget of the centre. However, only 22% of staff members are financed through core funding. This could become a threat should competitive funding be scarce. The relationship between R&D staff and core staff is balanced to the expected ratio: 7% of CREAF staff are civil servants. This extremely efficient percentage should be reconsidered in case of growth of the centre.
- 6) The dissemination activities of CREAF are defined in its strategic plan of communication, focusing not only in external communication, but also in an efficient internal communication. The CERCA committee considers this a

positive approach which helps to strengthen the social and scientific image and the smooth operation of CREAF.

Annex 2 contains the full report of the CERCA committee.

d) SWOT analysis

The members of the management team carried out a SWOT analysis of the centre to detect current and future opportunities and threats, as well as the strengths that will provide support and the weaknesses to overcome in order to face any proposed challenge. The SWOT analysis stems from the combination of the discussion of the management team and the recommendations of international and CERCA committees. Detected elements are as follows:

Environment opportunities:

- Growing importance of environmental issues requiring solutions and qualified scientific research.
- Importance of the Mediterranean Sea as a hot spot with insufficient research on global change.
- Social awareness towards certain environmental issues related to global change.
- Growing development of information and communication technologies (IT).
- State regulations and European and international directives related to IT.
- Specific sources of funding for IT.
- Development of new technologies of data generation and analysis.
- Consolidation of the CERCA system.
- Location of CREAF at the Research Park and the UAB Campus of International Excellence.
- Easy use of infrastructures and services of the trustees of the centre.
- Agreement with Collserola Park to share Can Balasc as a biological station.

- Participation of Catalonia in the *Governors' Climate and Forests Task Force* (GCF).
- Positioning of Barcelona in the leadership of IT and management of green infrastructure.

Environment threats:

- Highly unfavorable Catalan and Spanish financial context.
- Unstable political context.
- Significant and sustained reduction in national funds for R&D&i.
- Unfavorable financial situation of the CREAM trustees.
- Trend to concentrate research in limited big centres.
- Increasing competition in R&D&i with private companies.
- Increase of bureaucracy in public administrations.
- Lack of awareness by national and European governments of the task performed by CREAM.
- Rising competition for research resources.
- Unclear affiliation of the centre inside the Catalan Government's organization chart.
- Possible stagnation in the incorporation of senior and junior researchers into the research system.
- Prioritization of research goals in very specific areas.
- Reduced importance of basic research in research plans.
- Assessment of research based on quantity instead of quality.
- Reduced importance of environmental policies in Catalonia and Spain.

Strengths of the centre:

- Possession of its own legal entity.
- CREAM Board of Trustees incorporated into Spanish National Research Council (CSIC).
- Board of Trustees support in actions developed from the centre.
- Appropriate combination of multidisciplinary research and development.
- Increase in quantity and quality of research produced by the centre.

- Development of specialized quality training, thanks to its link with the university world.
- Sound institutional relations.
- Autonomy and easy collaboration of researchers.
- Rising potential for the attraction of funds.
- Low level of bureaucracy, adjusted to external demands.
- Flexible working conditions.
- Easy access to specialized training for staff.
- High rate of stable CREAM researchers financed by other institutions: UAB, UB, CSIC and ICREA. They confer a significant added value to the scientific activity in the centre.
- Location in the UAB campus. It encourages intellectual exchange and facilitates the recruiting of new talents and the access to services.
- Growing internationalization of the centre.
- Existence of a very efficient communication strategy at a national level.
- Better understanding of the functioning of EU research programs.
- Rising number of established researchers.
- Consolidation of CREAM as an instrument of the Catalan Government.
- Increase in the efficiency of the centre's organization.

Weaknesses of the centre:

- Lack of a body of representation / decision-making integrating all project managers (or senior researchers) at CREAM.
- Shortage of research infrastructures and support staff.
- Limited space.
- Little international leadership and very few researchers of the centre in international committees.
- Small number of postdocs.
- Increase in the time devoted to the attraction of funds by project managers.
- Excessive management load by project managers.
- Lack of meeting and discussion spaces for intellectual exchange.

- Little influence in decision-making of territory management in Catalonia and Spain.
- Occasional contradictions within the Board of Trustees in their expectations of the centre's mission.
- Uneven size of research groups.
- Low rate of women researchers.
- Low rate of established international researchers.
- Limited dedication to research by most staff because of their teaching activity.
- Underdevelopment of the communication strategy at an international level.
- Lack of knowledge of and networking with the private sector.
- Low technological transfer to the private sector.
- Lack of internal policies for evaluating and promoting research groups.
- Lack of a strategy to prioritize research lines.
- Lack of stability for technical and research staff.
- Little structural funding.
- Lack of resources and strategies for recruiting international talent.

2014-2017 Strategic Plan

The making of CREAM's new strategic plan has been coordinated by the management team (Javier Retana, Marta Barceló, Jose Antonio Fuentes, Maria Mayol, Jordi Vayreda, Joan Pino, Daniel Sol and Josep Maria Alcañiz). The process started with work sessions every two weeks, from January to October 2013, to prepare a preliminary working document. During the first meetings the strategic plan in force (2010-2013) was assessed. Then, all the diagnostic information of the centre was analyzed, including the compliance level with the former strategic plan, and external assessments conducted by the International Scientific Committee and the CERCA committee. Finally, the mission and the scope of the centre were revised and the SWOT analysis was made, thus enabling the creation of the most feasible scenario. Stemming from the analysis of these data, the management team defined strategic lines and goals (strategic and operational) for each line, and a proposed action for each of them. Indicators were established to determine the progress of the different operational goals, the baseline and forecast values for different years and the prioritization of operational goals over the years. Finally the follow-up mechanism for the level of compliance with the Strategic Plan was determined.

This first proposal of a strategic plan was presented to the researchers of the centre, whose contributions were included in the version presented to the management board of CREAM. The board held three separate sessions to discuss the different parts of the plan. The resulting document was presented to all members of CREAM for final contributions. A complete version of the plan was discussed by the management board and was forwarded to the Board of Trustees. Lastly, the Board of Trustees approved the definitive version of the 2014-2017 strategic plan.

CREAF Mission

CREAF is a public research centre in terrestrial ecology, analysis of the territory and global change pursuing excellence in knowledge generation, methodological development, innovation, knowledge transfer, training, and dissemination.

The centre aims to contribute to the knowledge, conservation and management of natural environment and territory, and to the adaptation to environmental changes at a local, regional and global level, encouraging the link between the academic world, administrations and society, and creating opinion in its scopes of action.

CREAF Vision

The CREAM vision for 2017 includes the attainment of the following goals:

- To perform an excellent research and development in order to increase the knowledge of natural systems that can be applied to enhance the conservation and management of natural environment and territory.
- To position CREAM as a global benchmark in terrestrial ecology, analysis of the territory and global change in the Mediterranean basin.
- To spread synergies between scientific research and technological development to face the needs of administrations and the private sector in environmental management and territorial planning.
- To be progressively less dependent on social and economic circumstances, with an efficient management and a high ability to obtain resources while maintaining the financial balance.
- To be a team composed by people sharing the mission of the centre and acting proactively in the fulfillment of the scope, with a flexible organization encouraging collaboration and permeability in research groups.
- To gain visibility among the scientific community, administrations and the general public in order to gain relevance in the discussion and decision-making on environmental issues.
- To guarantee a framework based on ethics, cooperation, equal opportunities and environmental liability.

CREAF's Preferred Strategy

In order to define the preferred strategy of the centre, a SWOT matrix has been created from the production and combination of matrixes of Assessment of External Factors (AFE) and Assessment of Internal Factors (AFI). This methodology is very common in the production of internal and external audits, in companies and institutions, stemming from a previous SWOT analysis.

First, the AFE matrix was obtained taking as the baseline those environmental factors, identified as threats and opportunities in the SWOT analysis of the centre (see Analysis of the centre section). A weight from 0 (not important) to 1 (very important) was assigned to these factors. The weight represents the relative importance of each factor for the success of CREAM (the sum of all weights must be 1). Each factor was later assigned a grade according to its degree of opportunity or threat following these values:

1. Major threat
2. Minor threat
3. Minor opportunity
4. Major opportunity

Secondly, the AFI matrix was obtained from internal factors identified as weaknesses and strengths in the same SWOT analysis. Just like before, a weight from 0 (not important) to 1 (very important) was assigned to them. The sum of all weights must also be 1. They were later assigned a grade according to the weakness or strength they represent:

1. Major weakness
2. Minor weakness
3. Minor strength
4. Major strength

Each member of the CREAM management team has assigned his or her own weights to factors of both matrixes and subsequently average values for each of them have been obtained. Grade values, on the other hand, were reached by consensus.

Tables 14 and 16 detail the results of the analysis of internal factors (strengths and weaknesses) and external factors (threats and opportunities), respectively. Regarding internal factors, the most important identified strengths (grade 4), sorted in descending order of weight value, are the funding of a core of permanent researchers (from UAB, UB, CSIC and ICREA), and the increase in (i) quantity and quality of produced research, (ii) the number of established and associate researchers and (iii) the potential for attracting funds. The growing internationalization of the centre and its combination of multidisciplinary research and development are also considered relatively important strengths. The most important weaknesses (grade 1) sorted in descending order of weight value are the centre's scarce structural funding and its still limited internationalization in relevant facts (little international leadership, very few researchers in international committees and a low rate of established international researchers). The underdevelopment of an effective communication strategy at an international level should also be pointed out, as well as the lack of a strategy to prioritize research lines. Finally, the low technological and knowledge transfer currently carried out by the centre and the lack of stability for technical and research staff should also be noted.

As regards external factors, the most significant opportunities (grade 4) are the growing importance of environmental issues, which require solutions and qualified scientific research and the specific sources of funding for these issues, and the agreement with Collserola Park for the transfer of Can Balasc to be used as a biological station. The most significant threats (grade 1) sorted in descending order of weight value are the harsh Spanish financial context, the significant and sustained reduction in national funds for R&D&i, the unfavorable financial situation of the CREAM trustees, rising competition for research resources, and the trend to concentrate research in limited big centres. Also, the reduced importance of basic research in

research plans and the lack of awareness of the task performed by CREAF among national, regional and local governments have been considered significant.

Table 15. Matrix of assessment of internal factors (AFI), detailing the weight of each strength and weakness, its grade and relative weight obtained by multiplying its weight by its grade.

Internal factors	Grade	Weight	Relative weight
Strengths			
High rate of stable CREAF researchers financed by other institutions: UAB, UB, CSIC and ICREA. They confer a significant added value to the scientific activity of the centre.	4	0.05	0.19
Increase in quantity and quality of research produced by the centre	4	0.04	0.17
Rising number of established researchers	4	0.04	0.15
Rising potential for the attraction of funds	4	0.04	0.14
Combination of multidisciplinary research and development	4	0.03	0.12
Growing internationalization of the centre	4	0.03	0.12
Autonomy and easy collaboration of researchers	3	0.03	0.09
Existence of a very efficient communication strategy at a national level	3	0.03	0.08
Better understanding of the functioning of EU research programs	3	0.03	0.09
Flexible working conditions	3	0.03	0.08
CREAF board of Trustees incorporated into CSIC	3	0.03	0.08
Possession of CREAF's own legal entity	3	0.03	0.08
Consolidation of CREAF as an instrument of the Catalan Government	3	0.02	0.07

Development of specialized quality training, thanks to its link with the university world.	3	0.02	0.05
Increase in the efficiency of the centre's organization	3	0.02	0.06
Easy access to specialized training for staff	3	0.01	0.04
Location in the UAB campus	3	0.01	0.04
Low level of bureaucracy, adjusted to external demands	3	0.01	0.04
Sound institutional relations	3	0.01	0.03
Board of Trustees support in actions developed from the centre	3	0.01	0.03
Weaknesses			
Little structural funding	1	0.04	0.04
Little international leadership and very few researchers in international committees	1	0.03	0.03
Low technological transfer to the private sector	1	0.03	0.03
Low rate of established international researchers	1	0.03	0.03
Lack of a strategy to prioritize research lines	1	0.03	0.03
Underdevelopment of the communication strategy at an international level	1	0.03	0.03
Lack of stability for technical and research staff	1	0.02	0.02
Limited dedication to research by most staff because of their teaching activity	2	0.04	0.08
Little influence in decision-making in Catalonia and Spain	2	0.03	0.06
Lack of knowledge of and networking with the private sector	2	0.02	0.04
Small number of postdoctoral researchers	2	0.02	0.05
Lack of internal policies for evaluating and promoting research groups	2	0.02	0.05

Limited space	2	0.02	0.04
Shortage of research infrastructures and support staff	2	0.02	0.04
Excessive management load by project managers	2	0.02	0.04
Lack of a body of representation of project managers or senior researchers	2	0.01	0.02
Uneven size of research groups	2	0.01	0.02
Occasional contradictions among the Board of Trustees' expectations of the centre's mission	2	0.01	0.02
Increase in the time devoted to the attraction of funds by project managers	2	0.01	0.02
Low rate of women researchers	2	0.01	0.02
Lack of meeting and discussion spaces for intellectual exchange	2	0.01	0.02
Lack of resources and strategies for recruiting international talents	2	0.01	0.02
TOTAL		1.00	2.52

Table 16. Matrix of assessment of external factors (AFI), detailing the weight of each opportunity and threat, its grade and relative weight obtained by multiplying its weight by its grade.

External factors	Grade	Weight	Relative weight
Opportunities			
Growing importance of environmental issues which require solutions and qualified scientific research	4	0.05	0.20
Specific sources of funding for IT	4	0.04	0.16
Agreement with Collserola Park for the transfer of Can Balasc to be used as a biological station.	4	0.04	0.18

Development of new technologies of data generation and analysis	4	0.04	0.15
Importance of the Mediterranean Sea as a hot spot with insufficient research on global change	3	0.05	0.14
Social awareness towards certain environmental issues related to global change	3	0.05	0.14
Growing development of information and communication technologies (IT)	3	0.05	0.14
Participation of Catalonia in the Governors' Climate and Forests Task Force (GCF)	3	0.04	0.12
Positioning of Barcelona in the leadership of IT and management of green infrastructure	3	0.03	0.08
State regulations and European and international directives related to IT	3	0.03	0.09
Consolidation of the CERCA system	3	0.03	0.08
Easy use of the trustees' infrastructures and services	3	0.03	0.08
Location of CREAF at the Research Park and the UAB Campus of International Excellence	3	0.02	0.06
Threats			
Harsh Catalan and Spanish financial context	1	0.06	0.06
Significant and sustained reduction in national funds for R&D&i	1	0.06	0.06
Unfavorable financial situation of the CREAF trustees	1	0.05	0.05
Rising competition for research resources	1	0.04	0.04
Trend to concentrate research in limited big centres	1	0.04	0.04
Reduced importance of basic research in research plans	1	0.03	0.03
Lack of awareness of the task performed CREAF among national and European governments	1	0.02	0.02
Unstable political context	2	0.04	0.08

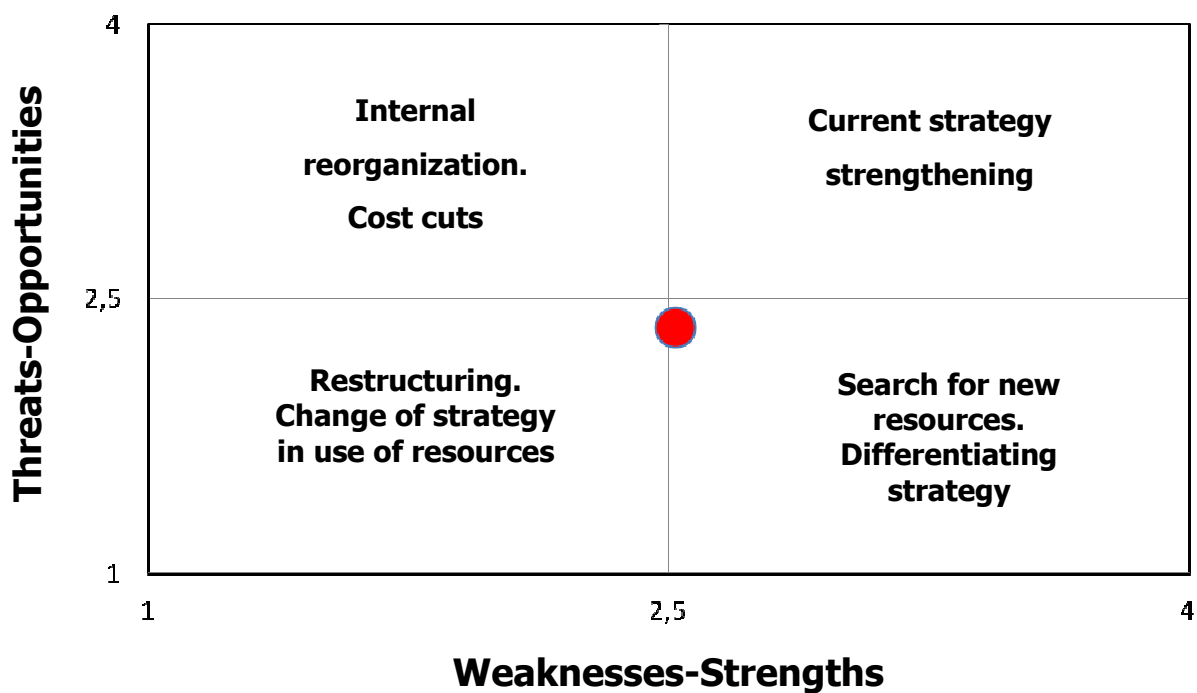
Possible stagnation in the incorporation of senior and junior researchers into the research system	2	0.04	0.09
Prioritization of research goals in very specific areas	2	0.03	0.07
Reduced importance of environmental policies in Catalonia and Spain	2	0.03	0.06
Unclear assignment of the centre within the Catalan Government's organization chart	2	0.02	0.04
Assessment of research based on quantity instead of quality	2	0.02	0.04
Increasing competition in R&D&I with private companies	2	0.02	0.04
Increase of bureaucracy in public administrations	2	0.01	0.02
TOTAL		1.00	2.35

Final values of the matrix were obtained by multiplying relative weights by their grades, which were later added up to obtain the internal position of the centre (strengths and weaknesses) in relation to the environment (threats and opportunities) shown in the SWOT chart (Figure 1). The position of the centre in the chart is determined by the *potentials* of the centre, the combinations of strengths and opportunities (SO), which point out the most promising lines of action for the organization, and the *limitations*, determined by the combination of weaknesses and threats (WT). The combination of strengths and threats are the *risks* and the combination of weaknesses and opportunities are the *challenges* to tackle to establish the new path of the centre (Figure 1).

The results obtained by the joint analysis of internal and external factors (Figure 1) show a well balanced position of CREAM both in internal and external space, a fact that suggests the need for a multiple strategy taking into account different factors. Nevertheless, it is pointed out that weaknesses and opportunities are slightly above strengths and threats, respectively. This suggests the need to differentiate the strategy for attracting funds to the centre, with new sources of funding, alliances and

users of products. The result will be the pursuit of excellence, the internationalization and consolidation of the centre as a benchmark in ecology of the Mediterranean regions, and the enhancement of transfer. At the same time, this suggests the need for the remodeling of the internal operation to optimize the centre’s resources, with a better definition of the research lines and the use of key infrastructures (Can Balasc), an enhancement of efficiency and organization, and an increase in staff training. All these elements have been taken into account while designing strategic and operational goals for the different lines of the plan.

Figure 1. Situation of CREAF inside SWOT space.



Lines, Goals and Actions

In order to develop the preferred strategies devised, the strategic plan is divided into **five areas defining strategic lines**. These areas are:

- Research
- Transfer
- Organization
- Training
- Communication

Strategic lines, with the description of strategic goals (OE), operational goals (OO), the indicators of different operational goals and potential actions for fulfillment, are introduced.

LINE 1. RESEARCH

OE 1.1 To perform excellent, innovative and cutting-edge research.

OO 1.1.1 To redefine the research lines of the centre.

INDICATOR Map of the research lines of the centre (Y/N)

- To identify potentials and weaknesses of the research groups of the centre.
- To identify the lines with which CREAM can become an international leader taking into account future international research priorities.
- To create a new map with the research lines of the centre.

OO 1.1.2 To recruit senior scientists of maximum excellence.

INDICATOR Number of recruited senior researchers

- To take advantage of all public calls for human resources.

- To promote agreements with the trustees for the creation of new positions.
- To enhance the assessment and selection system of senior candidates.
- To identify elements to make our research appealing for international researchers and to develop communication strategies to promote them.
- To promote a multidisciplinary and complementary approach in the profiles of the researchers at the centre.

OO 1.1.3 To recruit junior researchers of renowned value.

INDICATOR Number of postdocs per year

- To take advantage of all public calls for human resources.
- To establish an identification system for the best young talent at national and an international level.
- To enhance the assessment and selection system of young candidates.
- To develop a system of sponsorship to hold a postdoctoral call for the centre.

OO 1.1.4 To recruit and retain technical and support staff.

INDICATOR Number of technical and support staff / Number of technical and support staff with permanent contracts

- To take advantage of all public calls for human resources linked to recruiting support staff.
- To promote the consolidation of technicians by means of specific calls of UAB, UB and CSIC.
- To promote stable agreements with centres of professional training for internships and other collaboration options.

OO 1.1.5 To raise the scientific quality and productivity of the centre's researchers.

INDICATORS (i) Average h-index of researchers at the centre, (ii) number of total SCI articles per year, Q1 and Q2, (iii) number of granted international projects led by CREAM

- To find strategies to increase the quantity and quality of publications of international impact.

- To develop mechanisms to increase the number of international competitive projects led by CREAM.
- To develop mechanisms to enable researchers to compete for ERC calls.
- To promote a regular scientific assessment of researchers.

OO 1.1.6 To increase the collaboration of the different research groups in the centre.

INDICATOR Percentage of researchers sharing articles or projects

- To open the position of Scientific Coordinator to boost interdisciplinary research and promote collaboration among groups in the centre.
- To encourage the collaboration of researchers from different groups of CREAM in joint publications and projects.
- To launch one or two integrating research projects.

OO 1.1.7 To obtain the EU certification for Human Resources Excellence in Research.

INDICATOR Grant of the certification HR Excellence in Research

- To prepare and submit the certification document to EU.

OE 1.2 To enhance the internationalization of CREAM and to position it as a benchmark in terrestrial ecology, analysis of the territory and global change for the Mediterranean regions.

OO 1.2.1 To increase the international visibility of CREAM.

INDICATOR (i) Ranking of international positioning of the centre (ii) Map of international partners

- To increase the collaboration of CREAM with other international centres.
- To boost the inclusion of CREAM researchers at international committees.
- To release data generated by CREAM to the international scientific community.

OO 1.2.2 To promote the international exchange of researchers.

INDICATOR Number of researcher exchanges

- To set up mechanisms for an easy incorporation of research visitors.
- To set up mechanisms to facilitate stays abroad for CREAM researchers.

OO 1.2.3 To promote a scientific network in the Mediterranean arc.

INDICATOR Number of permanent contacts with international centres

INDICATOR Number of projects with international centres

- To make contact and establish permanent collaborations with institutions, associations and platforms of R&D&i in the Mediterranean arc.
- To identify synergies with other research centres and establish bridges to boost the joint participation in R&D&i projects.
- To present a project to the public call of the Union for the Mediterranean.

OO 1.2.4 To position Can Balasc as an international biological station.

INDICATOR Number of activities carried out in Can Balasc

- To develop the action plan for Can Balasc.
- To explore alliances with other research centres and observatories.
- To establish a long-term monitoring system of global change impacts focused on Can Balasc.
- To hold national and international workshops in Can Balasc.

LINE 2. TRANSFER

OE 2.1 To improve the transfer of knowledge and tools to the public and the private sectors.

OO 2.1.1 To diagnose the transfer potential of the centre.

INDICATOR Diagnosis of the transfer potential of the centre (Y/N)

- To create a map of the the public and the private sectors' needs related to the research lines of the centre.
- To create a map of the centre's deal flow.
- To establish the priority transfer lines for the centre.

OO 2.1.2 To establish a general protocol for knowledge transfer generated by the centre and aimed at potential users.

INDICATOR Established protocol (Y/N)

- To classify all research generated at the centre according to the needs of potential users.
- To formulate a transfer protocol with this classified information.
- To link this protocol with the communication strategy of the centre.
- To define the CREAM policy of intellectual property.

OO 2.1.3 To increase the number of projects and agreements with companies and institutions.

INDICATOR Number of projects granted and agreements awarded per year

- To analyze the new European framework defining EU's Horizon 2020.
- To analyze the new framework derived from Spain's new National Plan on R&D&i.
- To explore other national and international calls.
- To explore the types of companies and administrations with which collaborations could be established.
- To implement these collaborations as project and agreement proposals.

OO 2.1.4 To consolidate and enhance the transfer of tools (IT, models) of the centre.

INDICATOR Increase in the number of users (individuals and institutions)

- To promote the creation of spin-off platforms for transferring certain tools.
- To set up alliances with private companies for the development and transfer of certain tools.

OO 2.1.5 To promote activities for the transfer of knowledge, products and tools.

INDICATOR Number of transfer activities per year

- To boost transfer seminars and scientific symposiums with administrations and environment and territory managers.
- To invite representatives of regional, national and European political institutions regularly.
- To organize and teach specialized courses aimed at technicians and managers.
- To establish an environment training program at Can Balasc, aimed at top and medium positions of companies and administrations.
- To establish a workshop and seminars program at Can Balasc to support decision-making.

OE 2.2 To consolidate CREAM as a support centre for decision-making on environment management and territorial planning.

OO 2.2.1 To preserve environment data generated at the centre and broaden the online warehouse.

INDICATOR Number of available databases

- To define a plan for the preservation of CREAM's digital data.
- To keep the map server managed by CREAM updated.
- To keep the database server generated by the centre updated.
- To create a dynamic data server with all data of global change follow-up plots.

OO 2.2.2 To increase the involvement in sectoral working groups and pertinent forums on environment discussion, both at a national and an international level.

INDICATOR Number of entries in forums on environment discussion per year

- To identify the most pertinent forums.
- To propose potential participants from the centre for these forums.

OO 2.2.3 To increase the support in local and national decision-making processes for environment and territory planning and management.

INDICATOR Number of participations and formal recommendations per year

- To participate in legislative initiatives and planning proceedings of forestry, environmental and territorial sectors, both during drafting and consulting phases.
- To take part in environment sectoral working groups, forums and discussions.
- To establish a consultation protocol for the administration.
- To take part in pertinent boards of advisors on environmental issues.

LINE 3. ORGANIZATION

OE 3.1 To develop a strategy of the centre focused on improving the attraction of resources based on financial sustainability.

OO 3.1.1 To develop a strategy of potential alliances with other institutions.

INDICATOR Report of the strategy of alliances of CREAM (Y/N)

- To create a map with possible institutions to collaborate with.
- To analyze possible forms of alliance with other institutions.
- To network and explore ideal forms of alliance with several pertinent institutions.

OO 3.1.2 To ensure the financial sustainability of the centre.

INDICATOR Operating Income + Canon – Structural Expenses > 0

INDICATOR Rate of income inequality

- To establish contributions of trustees according to the operational needs.
- To promote a global strategy for attracting resources to the centre.
- To define the typology of the canon (*overheads*) and its application.
- To optimize the use of the centre's financial resources.
- To increase income diversification.

OO 3.1.3 To increase the involvement of researchers in project applications.

INDICATOR Number of competitive proposals from the centre

INDICATOR € obtained through projects / € obtained by contributions of trustees

- To maintain and enhance the assistance provided to researchers in their requests for proposals.
- To record all applied and granted projects to PIs with full-time research.

OE 3.2 To establish a strategy of investments and efficient use of infrastructures and services.

OO 3.2.1 To accurately program the investment needs (inventoriable) of the centre.

INDICATOR Budget Investments = Real Investments

- To promote a budget system for investments that takes into account the needs of the centre.
- To create a portfolio of uncovered and necessary requirements for the centre, to identify scientific and technical services that can be obtained from other bodies, and schedule their executions.
- To analyze investments according to their return, global requirements and potential outsourcing.

OO 3.2.2 To increase efficiency in the use of infrastructures and services.

INDICATOR Degree of use and satisfaction of infrastructures and services

- To adhere thoroughly to protocols of use of space and common goods (laboratories, warehouses, cars...).

- To establish the protocols for using the field stations (Can Balasc, Torre Marimon, among others) and other infrastructures (servers).
- To monitor the use and needs based on the services of the centre (computing and modeling).
- To define the procedure to contract out external services (outsourcing of the centre and projects).
- To optimize expenses of outsourcing external services.

OE 3.3 To establish a strategy for an efficient organization of CREAM.

OO 3.3.1 To review the governance model of the centre.

INDICATOR Review procedure (Y/N)

- To open a review procedure of the structure and functions of CREAM's governing bodies.
- To pass the suggestions on to different CREAM's governing bodies to take appropriate action, if necessary.
- To review the by-laws of CREAM with the incorporation of agreed modifications.

OO 3.3.2 To enhance the organization quality and efficiency of the centre.

INDICATOR Satisfaction survey

INDICATOR Job pool at CREAM (Y/N)

- To promote a quality system for the management of the centre.
- To define the processes and create the key procedures of the centre.
- To introduce the system of public procurement of CREAM.
- To extend the features of project management.
- To create a flexible job pool according to the circumstances of CREAM.
- To develop a system that enables an increase in the efficiency while reducing management time.
- To assess the implementation of an ISO 9000 quality system in the management of the centre.

OO 3.3.3 To introduce a system to evaluate the scientific quality and the management of the centre.

INDICATOR Evaluation system (Introduced/not introduced)

- To introduce an evaluation system and incentive scheme geared towards the research goals of the centre.
- To promote strategic investment for a better operation of groups of maximum excellence and the development of the most promising lines.
- To redefine different professional categories and ways of promotion in the centre.

OO 3.3.4 To set up an appropriate scientific environment to achieve all established goals.

INDICATORS (i) Creation of the Scientific Board, (ii) Creation of a space of discussion for researchers, (iii) Development of the scientific code of ethics.

- To create a scientific board within CREAM to promote scientific and organizational discussions at the centre.
- To create a space for casual and regular communication for researchers.
- To develop a scientific code of ethics and best practices.
- To foster intellectual exchange in order to encourage creativity through seminars, discussion forums and meetings.

OE 3.4 To improve the training and skills of the staff at the centre.

OO 3.4.1 To create an ongoing training plan for CREAM staff.

INDICATOR Number of training hours

- To establish a system to gather the training expectations of staff members.
- To consensually plan all training resources based on needs.
- To plan training workshops on the strategy and the operation of the centre.

OO 3.4.2 To align the staff with the strategy and operation of the centre.

INDICATOR Number of actions carried out per year

- To create an explanatory summary of indicators, expected results, policies and actions to be taken in the CREAM Strategic Plan.
- To plan training in strategy taught by external experts.

- To provide training in team management and group leadership.

LINE 4. TRAINING

OE 4.1. To promote high-level scientific training.

OO 4.1.1 To foster all master's degrees promoted by CREAM.

INDICATOR Number of students enrolled per year

- To improve the promotion of our master's degrees at a national and an international level.
- To increase the involvement of CREAM staff members in the teaching of master's degrees.
- To encourage the supervision of master's projects among CREAM staff members.
- To promote the official status of the master's degree of SIG and TD.
- To explore the possibility of promoting an international master's degree in Ecology and Global Change.

OO 4.1.2 To consolidate the PhD program of CREAM.

INDICATOR Number of PhD students enrolled per year

- To improve the promotion of the PhD program of CREAM at a national and an international level.
- To enhance the follow-up procedure of doctoral theses.
- To foster the shared responsibility between the supervisor and the student in the PhD program.
- To create a travel support service for the mobility of PhD students.
- To promote the creation of industrial doctorates.

OO 4.1.3 To enhance and increase the program of specialized courses and seminars.

INDICATOR (i) Number of specialized courses per year, (ii) Number of seminars per year

- To increase and diversify the number of specialized courses offered.
- To establish an annual program of seminars and conferences.
- To establish a procedure to invite important scientists to the courses and seminars program.
- To promote Can Balasc as a facility for courses and seminars.

LINE 5. COMMUNICATION

OE 5.1 To promote national and international visibility of activities in the centre among scientists, technicians, administrations and society.

OO 5.1.1 To encourage the use of digital tools in the centre's communication strategy.

INDICATOR Number of blog visits per year + Number of webpage visits per year + Number of newsletters opened per year

- To maintain and enhance the website to attain an excellent positioning in search engines and to provide it with a content manager.
- To create a monthly digital newsletter to disseminate the activity of the centre.
- To establish the CREAF blog as the main channel for publishing the activity of the centre.
- To assess the use of new digital tools for disseminating the research performed at the centre.
- To maintain the corporate Twitter account.
- To create a photographic database under a Creative Commons license for the staff.

OO 5.1.2 To boost the visibility of CREAM in mass media and among specialists.

INDICATOR Number of general impacts in the media

- To maintain an updated database of the main journalists specializing in environment and territory.
- To offer journalists information related to current affairs and the chance to talk with experts about burning issues.
- To encourage the creation of technical informational publications for specialist or technical media.
- To organize at least one annual training workshop for journalists on key issues within the CREAM scope.
- To establish permanent links with the departments of communication of institutions related to CREAM (DTES, DAAM, UAB, CSIC, etc.)

OO 5.1.3 To launch a procedure to disseminate the centre's developments in Spain and abroad.

INDICATOR (i) Number of impacts in national media (excluding Catalan media),

(ii) Number of impacts in international communication channels

- To identify, organize and contact the target audiences, at a national and an international level, of the different areas of CREAM.
- To create contents in English about the centre's main research.
- To communicate CREAM's research developments to pertinent European bodies regularly.
- To create a communication strategy for the European media.

OO 5.1.4 To enhance the dissemination of the centre's transfer, training and seminars programs.

INDICATOR Total number of participants in workshops

- To set up a dissemination protocol for activities carried out by CREAM.
- To add a Calendar section with a registration form including all activities of transfer, training and seminars in the new website.

- To issue news related to CREAM's training programs.

OE 5.2 To boost CREAM's internal communication

OO 5.2.1 To enhance procedures and workflows for CREAM's internal information.

INDICATOR Satisfaction survey for workers

- To improve the centre's internal information newsletter.
- To set up a new Intranet, more user-friendly and intuitive.
- To create a Welcome Guide for the centre.

OE 5.3 To promote the brand of the centre.

OO 5.3.1 To develop a CREAM brand according to its unique features.

INDICATOR External survey on brand perception (Y/N)

- To define the unique features of CREAM.
- To create contents describing the centre and its unique features.
- To promote the use of the CREAM Corporate Identity Manual.
- To adapt the corporate image of the centre's projects, activities and groups.
- To define the coexistence of the CREAM brand and the trustees' brands.

Action Plan

The Action plan determining **different operational goals**, as well as their assigned responsible agents, assessment indicators, proposed actions and schedule is developed below (Table 15).

Table 15. Table with multiple information. Operational goals to develop in order to achieve the strategic goals of the different lines. Assigned responsible agents, assessment indicators, proposed actions, external and internal funds and schedule are detailed for each operational goal. Priority actions are included. Legend: OE = Strategic Goal; OO = Operational Goal; I = Indicator; P = Period used to calculate baseline value; VR = Baseline Value; TPA = Total value of previous period (2009-2013); MPA = Average value of previous period (2009-2013).

LINE 1. RESEARCH

OE 1.1 To perform excellent, innovative and cutting-edge research.

OO 1.1.1 To redefine the research lines of the centre							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.1.1 Map of the research lines of the centre (Y/N)	Ad hoc committee	2013	-	-	Y	-	-	Y
Action					External funds	Internal funds	Schedule	
To identify potentials and weaknesses of the research groups of the centre. - PRIORITY ACTION					0€	0€	2014-2015	
To identify the lines with which CREAF can become an international leader taking into account future international research priorities. - PRIORITY ACTION					0€	0€	2014-2015	
To create a new map with the research lines of the centre. - PRIORITY ACTION					0€	0€	2014-2015	

OO 1.1.2 To recruit senior scientists of maximum excellence							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.1.2 Number of recruited senior researchers	Management team	TPA	4	1	1	1	1	4
Action					External funds	Internal funds	Schedule	
To take advantage of all public calls of human resources. - PRIORITY ACTION					762,500€	0€	2014-2017	
To promote agreements with the trustees for the creation of new positions.					0€	0€	2014-2017	
To enhance the assessment and selection system of senior candidates. - PRIORITY ACTION					0€	0€	2015	
To identify elements to make the centre's research appealing for international researchers and to develop communication strategies to promote them. - PRIORITY ACTION					0€	0€	2014-2017	
To promote the multidisciplinary and complementary quality of the centre's researchers' profiles.					0€	0€	2014-2017	

OO 1.1.3 To recruit junior researchers of renowned value							Responsible agent Researchers	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.1.3 Number of postdocs per year	Researchers	MPA	8	10	10	12	12	11
Action					External funds	Internal funds	Schedule	
To take advantage of all public calls for human resources. - PRIORITY ACTION					560,000€	0€	2014-2017	
To establish an identification system for the best young talent at a national and an international level. - PRIORITY ACTION					0€	0€	2014-2015	
To enhance the system for the assessment and selection of young candidates. - PRIORITY ACTION					0€	0€	2014-2015	
To develop a system of sponsorship to hold a postdoctoral call for the centre.					35,000€	0€	2015-2016	

OO 1.1.4 To recruit and retain technical and support staff							Responsible agent Researchers	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.1.4A Number of technical and support staff	Researchers	MPA	51	44	48	52	56	50
I 1.10.4B Number of technical and support staff with permanent contracts	Researchers	MPA	26	26	26	28	30	27
Action					External funds	Internal funds	Schedule	
To take advantage of all public calls for human resources linked to recruiting support staff.					480,000€	0€	2014-2017	
To promote the consolidation of technicians through specific calls of UAB, UB and CSIC.					40,000€	0€	2014-2017	
To promote stable agreements with centres of professional training for internships and other collaboration options.					0€	12,000€	2014-2017	

OO 1.1.5 To raise the scientific quality and productivity of our researchers							Responsible agent Management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.1.5A Average h-index of the centre's researchers	Researchers	MPA	19	19	21	23	25	22
I 1.1.5B Number of total SCI articles per year, Q1 and Q2	Researchers	MPA	108	130	135	135	140	135
I 1.1.5C Number of granted international projects led by CREAM	Researchers	TPA	4	1	1	1	2	5
Action					External funds	Internal funds	Schedule	
To find strategies to increase the quantity and quality of publications of international impact.					0€	0€	2014-2017	
To develop mechanisms to increase the number of international competitive projects led by CREAM. - PRIORITY ACTION					0€	32,000€	2014-2015	
To develop mechanisms to enable researchers to compete for ERC calls. - PRIORITY ACTION					0€	8,000€	2014-2015	
To promote a regular scientific assessment of researchers. - PRIORITY ACTION					0€	4,000€	2014-2017	

OO 1.1.6 To increase the collaboration of the different research groups in the centre							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.1.6 Percentage of researchers sharing articles or projects	Scientific coordinator	2013	8.0%	8.7%	9.3%	10.0%	10.6%	9.7%
Action					External funds	Internal funds	Schedule	
To open the position of Scientific Coordinator to boost interdisciplinary research and promote collaboration between groups in the centre. - PRIORITY ACTION					120,000€	0€	2014	
To encourage the collaboration of researchers from different CREAF groups in joint publications and projects.					0€	0€	2014-2017	
To launch one or two integrating research projects.					0€	7,000€	2015-2016	

OO 1.1.7 To obtain the EU Human Resources Excellence in Research certification							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.1.7 To obtain the HR Excellence in Research certification	Ad hoc committee	2013	-	Y	-	Y	-	Y
Action					External funds	Internal funds	Schedule	
To prepare and submit the certification document to EU. - PRIORITY ACTION					0€	0€	2014	

LINE 1. RESEARCH

OE 1.2 To enhance the internationalization of CREAM and to position it as a benchmark in terrestrial ecology, analysis of the territory and global change for the Mediterranean region.

OO 1.2.1 To increase the international visibility of CREAM							Responsible agent Management and manager for the attraction of funds	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.2.1A Ranking of the centre's international positioning*	Communication	2013	83.4	83.6	83.9	84.3	84.5	84.5
I 1.2.1B Map of international partners.	Manager for the attraction of funds	2013	Y	Y	Y	Y	Y	Y
Action						External funds	Internal funds	Schedule
To increase the collaboration of CREAM with other international centres.						0€	12,000€	2014-2017
To boost the inclusion of CREAM researchers in international committees. - PRIORITY ACTION						0€	12,000€	2014-2017
To release data generated by CREAM to the international scientific community.						0€	0€	2014-2017

*High Quality Publications: Q1 Rank (Scopus). Normalized indicator (scale 0-100).

OO 1.2.2 To promote the international exchange of researchers							Responsible agent Scientific coordinator	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.2.2 Number of researcher exchanges	Researchers	2013	19	20	20	21	22	20
Action					External funds	Internal funds	Schedule	
To set up mechanisms for an easy incorporation of research visitors.					0€	0€	2014-2017	
To set up mechanisms to facilitate stays abroad for CREAM researchers.					128,000€	12,000€	2014-2017	

OO 1.2.3 To promote a scientific network in the Mediterranean arc							Responsible agent Scientific coordinator	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.2.3A Number of permanent contacts with international centres	Scientific coordinator	2013	39	40	50	60	70	70
I 1.20.3B Number of projects with international centres	Scientific coordinator	2013	6	4	5	6	7	22
Action					External funds	Internal funds	Schedule	
To make contact and establish permanent collaborations with institutions, associations and platforms of R&D&i in the Mediterranean arc. PRIORITY ACTION					20,000€	16,000€	2015	
To identify synergies with other research centres and to establish bridges to boost the joint participation in R&D&i projects. PRIORITY ACTION					0€	0€	2014-2017	
To present a project to the public call of the Union for the Mediterranean.					0€	2,000€	2014-2017	

OO 1.2.4 To position Can Balasc as an international biological station							Responsible agent Committee for Can Balasc	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 1.2.4 Number of activities carried out in Can Balasc	Committee for Can Balasc	2013	0	1	1	2	2	6
Action					External funds	Internal funds	Schedule	
To develop the action plan for Can Balasc. - PRIORITY ACTION					0€	0€	2015	
To explore alliances with other research centres and observatories.					0€	8,000€	2015-2017	
To establish a long-term monitoring system of global change impacts focused on Can Balasc.					20,000€	0€	2015-2017	
To hold national and international workshops in Can Balasc.					24,000€	24,000€	2014-2017	

LINE 2. TRANSFER

OE 2.1 To improve the transfer of knowledge and tools to the public and the private sectors.

OO 2.1.1 To diagnose the transfer potential of the centre							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.1.1 Diagnosis of the transfer potential of the centre (Y/N)	Ad hoc committee	2013	-	-	Y	-	-	Y
Action					External funds	Internal funds	Schedule	
To create a map of the public and the private sectors' needs related to the centre's research lines. - PRIORITY ACTION					0€	0€	2014-2015	
To create a map of the centre's deal flow. - PRIORITY ACTION					0€	0€	2014-2015	
To establish the priority transfer lines for the centre. - PRIORITY ACTION					0€	0€	2014-2015	

OO 2.1.2 To establish a common protocol for knowledge transfer generated by the centre and aimed at potential users							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.1.2 Established protocol (Y/N)	Ad hoc committee	2013	-	-	Y	-	-	Y
Action					External funds	Internal funds	Schedule	
To classify all the research generated at the centre according to the needs of potential users. - PRIORITY ACTION					0€	0€	2015	
To formulate a transfer protocol with this classified information. - PRIORITY ACTION					0€	0€	2015	
To link this protocol with the strategy of the centre's communication.					0€	10,000€	2015	
To define the CREAM policy of intellectual property.					0€	2,500€	2015	

OO 2.1.3 To increase the number of projects and agreements with companies and institutions							Responsible agent Management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.1.3 Number of projects granted and agreements awarded per year	Researchers	MPA	16	16	18	22	24	20
Action					External funds	Internal funds	Schedule	
To analyze the new European framework defining EU's Horizon 2020.					0€	0€	2014	
To analyze the new framework derived from Spain's new National Plan on R&D&i.					0€	0€	2014	
To explore other national and international calls.					0€	0€	2014-2017	
To explore the types of companies and administrations with which collaboration could be established. - PRIORITY ACTION					0€	0€	2014-2017	
To implement these collaborations as project and agreement proposals. - PRIORITY ACTION					0€	6,000€	2014-2017	

OO 2.1.4 To consolidate and enhance the transfer of tools (IT, models) of the centre							Responsible agent Top management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.1.4 Number of users (individuals and institutions)	Top management	2013	17,665	+1%	+1%	+1%	+1%	+4%
Action					External funds	Internal funds	Schedule	
To promote the creation of spin-off platforms for the transfer of certain tools.					6,000€	0€	2014-2017	
To set up alliances with private companies for the development and transfer of certain tools.					0€	0€	2014-2017	

OO 2.1.5 To promote activities for the transfer of knowledge, products and tools							Responsible agent Researchers	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.1.5 Number of transfer activities per year	Communication department	MPA	11	13	15	17	19	75
Action					External funds	Internal funds	Schedule	
To encourage transfer seminars and scientific symposiums with administrations and environment and territory managers. - PRIORITY ACTION					4,000€	4,000€	2014-2017	
To invite representatives of regional, national and European political institutions regularly.					0€	4,000€	2014-2017	
To organize and teach specialized courses aimed at technicians and managers.					4,000€	4,000€	2014-2017	
To establish an environment training program aimed at top and medium positions of companies and administrations at Can Balasc.					2,000€	2,000€	2017	
To establish a workshop and seminars program to support decision-making at Can Balasc.					0€	2,000€	2017	

LINE 2. KNOWLEDGE TRANSFER

OE 2.2 To consolidate CREAF as a support centre for decision-making on environment management and territorial planning.

OO 2.2.1 To preserve environment data generated at the centre and broaden the online warehouse							Responsible agent Top management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.2.1 Number of available databases	Responsible agent appointed by management and top management	TPA	11	+1	+1	+1	+2	+5
Action					External funds	Internal funds	Schedule	
To define a plan for the preservation of CREAF's digital data.					0€	0€	2015	
To keep the map server managed by CREAF updated.					0€	24,000€	2014-2017	
To keep the database server generated by the centre updated.					0€	12,000€	2014-2017	
To create a dynamic data server with all data of global change follow-up plots.					0€	4,000€	2017	

OO 2.2.2 To increase the involvement in sectoral working groups and pertinent forums on environment discussion, both at a national and an international level							Responsible agent Ad hoc committee	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.2.2 Number of entries in discussion forums per year	Researchers	MPA	15	17	19	21	23	95
Action					External funds	Internal funds	Schedule	
To identify the most pertinent forums.					0€	0€	2014-2017	
To propose potential participants from the centre for these forums.					0€	0€	2014-2017	

OO 2.2.3 To increase the support to local and national decision-making processes for environment and territory planning and management							Responsible agent Ad hoc committee	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 2.2.3 Number of participations and formal recommendations per year	Researchers	-	-	3	3	4	5	15
Action					External funds	Internal funds	Schedule	
To participate in legislative initiatives and planning proceedings of forestry, environmental and territorial sectors, both during drafting and consulting phases.					0€	0€	2014-2017	
To take part in environment sectoral working groups, forums and discussions.					0€	0€	2014-2017	
To establish a knowledge transfer protocol for the administration.					0€	0€	2015	
To take part in pertinent boards of advisors for environmental issues.					0€	0€	2014-2017	

LINE 3. ORGANIZATION

OE 3.1 To develop a strategy of the centre focused on improving the attraction of resources and based on financial sustainability.

OO 3.1.1 To develop a strategy of potential alliances with other institutions							Responsible agent Management Team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.3.1A Report of CREAM's strategy of alliances	Management team	-	-	-	Y	-	-	Y
Action					External funds	Internal funds	Schedule	
To create a map with possible institutions to collaborate with. - PRIORITY ACTION					0€	0€	2015	
To analyze possible forms of alliance with other institutions. - PRIORITY ACTION					0€	0€	2015-2016	
To network and explore ideal forms of alliance with several pertinent institutions. - PRIORITY ACTION					0€	0€	2015-2017	

OO 3.1.2 To ensure the financial sustainability of the centre							Responsible agent Top management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.1.2A Operating Income + Canon – Structural Expenses > 0	Top management	2013	<0	≥0	≥0	≥0	≥0	>0
I 3.1.2B Rate of income inequality	Management team	MPA	0.48	0.4	0.4	0.35	0.3	0.3
Action					External funds	Internal funds	Schedule	
To establish the contributions of trustees according to the operational needs.					0€	0€	2014-2017	
To promote a global strategy for attracting resources to the centre.					0€	0€	2014-2017	
To define the typology of the canon (<i>overheads</i>) and its application.					0€	0€	2015	
To optimize the use of the centre’s financial resources. - PRIORITY ACTION					0€	0€	2014-2017	
To increase income diversification. - PRIORITY ACTION					120,000€	80,000€	2014-2017	

OO 3.1.3 To increase the involvement of researchers in project applications							Responsible agent Management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.1.3A Number of competitive proposals by the centre	Project Management	2013	39	40	41	42	43	41
I 3.1.3B € obtained through projects / € obtained by contributions of trustees	Top management	MPA	2.18	2.13	2.45	2.65	2.96	2.55
Action					External funds	Internal funds	Schedule	
To maintain and enhance the assistance provided to researchers in their requests for proposals. - PRIORITY ACTION					0€	0€	2014-2017	
To record all projects applied for and granted by PIs with full-time research.					0€	0€	2014-2017	

LINE 3. ORGANIZATION

OE 3.2 To establish a strategy of investments and efficient use of infrastructures and services.

OO 3.2.1 To accurately program the investment needs (inventoriable) of the centre							Responsible agent Management team and scientific board	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.2.1 Budget Investments = Real Investments	Top management	MPA	47%	±10%	±10%	±5%	±5%	±7.5%
Action					External funds	Internal funds	Schedule	
To promote a budget system for investments that takes into account the needs of the centre. - PRIORITY ACTION					0€	0€	2014	
To create a portfolio of uncovered and needed requirements of the centre, to identify scientific and technical services that can be obtained from other bodies, and schedule their executions. - PRIORITY ACTION					0€	0€	2014-2017	
To analyze investments according to their return, global requirements and potential outsourcing.					0€	0€	2014-2017	

OO 3.2.2 To increase efficiency in the use of infrastructures and services							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.2.2 Survey on the degree of use and satisfaction of infrastructures and services	Management team	-	-	Y	-	-	Y	Y
Action					External funds	Internal funds	Schedule	
To adhere thoroughly to the protocols of use of space and common goods (laboratories, warehouses, cars...). - PRIORITY ACTION					0€	0€	2014-2017	
To establish the protocols for the use of the field stations (Can Balasc, Torre Marimon, among others) and other infrastructures (servers).					0€	0€	2014-2015	
To monitor the use and needs based on the centre's services (computing and modeling). - PRIORITY ACTION					0€	0€	2014-2017	
To define the procedure to contract external services (outsourcing of the centre and projects).					0€	0€	2014-2015	
To optimize expenses of outsourcing external services.					0€	0€	2014-2017	

LINE 3. ORGANIZATION

OE 3.3 To establish a strategy for an efficient organization of CREAM.

OO 3.1.1 To review the governance model of the centre							Responsible agent Management team and management board	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.1.1A Review procedure	Management team	-	-	-	-	Y	-	Y
Action					External funds	Internal funds	Schedule	
To open a review procedure for the structure and functions of CREAM's governing bodies. - PRIORITY ACTION					0€	0€	2015-2016	
To pass the suggestions on to different CREAM governing bodies so that they take appropriate action, if necessary. - PRIORITY ACTION					0€	0€	2016-2017	
To review the by-laws of CREAM with the incorporation of the agreed modifications. - PRIORITY ACTION					0€	0€	2016-2017	

OO 3.3.2 To enhance the organization quality and efficiency of the centre							Responsible agent Top management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.3.2A Satisfaction survey	Top management	-	-	Y	-	-	Y	Y
I 3.3.2B CREAF's job pool (Y/N)	Top management	-	-	-	Y	-	-	Y
Action					External funds	Internal funds	Schedule	
To promote a quality system for the management of the centre. - PRIORITY ACTION					0€	0€	2015	
To define processes and create key procedures for the centre.					0€	0€	2014-2015	
To introduce the CREAF system of public procurement.					0€	5,000€	2014	
To extend the features of project management.					0€	20,000€	2015	
To create a flexible job pool adjustable to the circumstances of CREAF.					0€	4,000€	2015	
To develop a system that enables an increase in efficiency while reducing management time. - PRIORITY ACTION					40,000€	0€	2014-2017	
To assess the implementation of an ISO 9000 quality system in the management of the centre.					0€	8,000€	2016	

OO 3.3.3 To introduce a system for the evaluation of the centre's scientific quality and its management							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.3.3 Evaluation system (Introduced/not introduced)	Management team	-	-	-	-	Y	-	Y
Action					External funds	Internal funds	Schedule	
To introduce an evaluation system and incentive scheme geared towards the research goals of the centre. - PRIORITY ACTION					0€	0€	2016	
To promote strategic investment for a better operation of the groups of maximum excellence and the development of the most promising lines. - PRIORITY ACTION					60,000€	20,000€	2015-2017	
To redefine different professional categories and ways of promotion in the centre. - PRIORITY ACTION					45,000€	45,000€	2015	

OO 3.3.4 To set up an appropriate environment to achieve all established goals							Responsible agent Ad hoc committee	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.3.4A Creation of the Scientific Board	Management team	-	-	-	Y	-	-	Y
I 3.3.4B Creation of a space of discussion for researchers	Management team	-	-	-	-	Y	-	Y
I 3.3.4C Development of the scientific code of ethics	Management team	-	-	-	Y	-	-	Y
Action					External funds	Internal funds	Schedule	
To create a scientific board within CREAF to promote scientific and organizational discussions at the centre. - PRIORITY ACTION					0€	0€	2015	
To create a space for casual and regular communication for researchers.					0€	2,000€	2016	
To develop a scientific code of ethics and best practices. - PRIORITY ACTION					0€	0€	2015	
To foster an intellectual environment to encourage creativity through seminars, discussion forums and meetings.					0€	0€	2014-2017	

LINE 3. ORGANIZATION

OE 3.4 To improve the staff's training and skills.

OO 3.4.1 To create an ongoing training plan for CREAM staff							Responsible agent Top management and company committee	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.4.1 Number of training hours	Top management	MPA	132	=	=	=	=	=
Action					External funds	Internal funds	Schedule	
To establish a system to gather the staff's training expectations.					0€	0€	2015	
To consensually plan all training resources based on needs. - PRIORITY ACTION					0€	0€	2014-2017	
To plan training workshops on the strategy and operation of the centre. - PRIORITY ACTION					0€	2,500€	2014-2017	

OO 3.4.2 To align staff with the strategy and operation of the centre							Responsible agent Management team	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 3.4.2 Number of actions carried out per year	Management team	-	0	1	2	2	2	7
Action					External funds	Internal funds	Schedule	
To create an explanatory summary of indicators, expected results, policies and actions to be taken in the Strategic Plan of CREAM. - PRIORITY ACTION					0€	0€	2014	
To plan training in strategy taught by external experts. - PRIORITY ACTION					0€	4,000€	2014-2017	
To offer training in team management and group leadership. - PRIORITY ACTION					0€	4,000€	2015-2017	

LINE 4. TRAINING

OE 4.1 To promote high level scientific training.

OO 4.1.1 To foster all master's degrees promoted by CREAM							Responsible agent Master's Degree coordinator	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 4.1.1 Number of students enrolled per year	Master's degree coordinator and researchers	MPA	45	45	47	48	50	47
Action					External funds	Internal funds	Schedule	
To improve the promotion of our master's degrees at a national and an international level.					0€	1,000€	2014-2017	
To increase the involvement of CREAM staff members in the teaching of master's degrees.					0€	0€	2014-2017	
To encourage the supervision of master's projects among CREAM staff members.					0€	0€	2014-2017	
To promote the official status of the master's degree of SIG and TD. - PRIORITY ACTION					0€	0€	2014	
To explore the possibility of promoting a new international master's degree in Ecology and Global Change.					0€	0€	2014-2015	

OO 4.1.2 To consolidate the PhD program of CREAM							Responsible agent PhD coordinator	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 4.1.2 Number of PhD students enrolled per year	PhD coordinator and researchers	MPA	9	10	10	10	11	10
<i>Action</i>					<i>External funds</i>	<i>Internal funds</i>	<i>Schedule</i>	
To improve the promotion of the PhD program of CREAM at a national and an international level. - PRIORITY ACTION					0€	1,000€	2014-2017	
To enhance the follow-up procedure of doctoral theses. - PRIORITY ACTION					0€	4,000€	2014	
To foster the shared responsibility between the supervisor and the student in the PhD program. - PRIORITY ACTION					0€	0€	2014-2017	
To create a travel support service for the mobility of PhD students.					0€	4,000€	2017	
To promote the creation of industrial doctorates					0€	0€	2014-2017	

OO 4.1.3 To enhance and increase the program of specialized courses and seminars							Responsible agent Seminar coordinator	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 4.1.3A Number of specialized courses per year	Course coordinator and researchers	2013	3	4	4	4	4	4
I 4.1.3B Number of seminars per year	Seminar coordinator and researchers	2013	7	9	11	12	13	11
Action					External funds	Internal funds	Schedule	
To increase and diversify the number of specialized courses offered.					0€	0€	2014-2017	
To establish an annual program of seminars and conferences. - PRIORITY ACTION					0€	7,500€	2015	
To establish a procedure to invite important scientists to the courses and seminars program.					15,000€	0€	2015	
To promote Can Balasc as a facility for courses and seminars.					0€	0€	2016	

LINE 5. COMMUNICATION

OE 5.1 To promote national and international visibility of activities in the centre among scientists, technicians, administrations and society.

OO 5.1.1 To encourage the use of digital tools in the centre's communication strategy							Responsible agent Communication	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 5.1.1A Number of blog visits per year	Communication department	2013	25,500	30,000	40,000	50,000	60,000	180,000
I 5.10.1B Number of webpage visits per year	Communication department	2013	34,864	40,000	50,000	60,000	70,000	220,000
I 5.1.1C Number of newsletter opened per year	Communication department	P (6 months * 2)	7,314	18,500	9,500	10,500	11,500	40,000
Action					External funds	Internal funds	Schedule	
To maintain and enhance the website to attain an excellent positioning in search engines and a content manager. - PRIORITY ACTION					7,800€	20,000€	2014-2017	
To create a monthly digital newsletter to disseminate the activity of the centre. - PRIORITY ACTION					10,400€	0€	2014-2017	
To establish the CREAF blog as the main channel for publishing the activity of the centre. - PRIORITY ACTION					27,000€	0€	2014-2017	
To assess the use of new digital tools for disseminating the research performed at the centre.					11,700€	4,000€	2014-2017	
To maintain the corporate Twitter account.					0€	0€	2014-2017	
To create a photographic database under a Creative Commons license for the staff.					0€	0€	2016	

OO 5.1.2 To boost the visibility of CREAM in mass media and among specialists							Responsible agent Communication	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 5.1.2 Number of general impacts in the mass media	Communication	MPA	125	130	140	145	150	565
Action					External funds	Internal funds	Schedule	
To maintain an updated database of the main journalists specializing in environment and territory.					0€	0€	2014-2017	
To offer journalists information related to current affairs and the chance to talk with experts about burning issues. - PRIORITY ACTION					3,900€	0€	2014-2017	
To encourage the creation of technical informational publications for specialist or technical media. - PRIORITY ACTION					0€	0€	2014-2017	
To organize at least one annual training workshop for journalists on key issues within the CREAM scope.					2,000€	3,000€	2015-2017	
To establish permanent links with the departments of communication of institutions related to CREAM (DTES, DAAM, UAB, CSIC, etc.)					0€	0€	2014-2017	

OO 5.1.3 To launch a procedure to disseminate the centre's developments in Spain and abroad							Responsible agent Management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 5.1.3A Number of impacts in national media (excluding Catalan media)	Communication	2013	105	125	150	175	200	650
I 5.1.3B Number of impacts in international communication channels	Communication	-	-	1	5	10	15	31
Action					External funds	Internal funds	Schedule	
To identify, organize and contact target audiences, at a national and an international level, of different areas of CREAM. - PRIORITY ACTION					0€	0€	2014-2017	
To create contents in English about the centre's main research. - PRIORITY ACTION					0€	8,000€	2014-2017	
To communicate CREAM 's research developments to pertinent European bodies regularly.					13,500€	0€	2014-2017	
To create a communication strategy for European media.					13,500€	0€	2015	

OO 5.1.4 To enhance the dissemination of knowledge transfer, training and seminars programs of the centre							Responsible agent Ad hoc committee	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 5.1.4 Total number of participants in workshops	Communication	2013	1,005	1,100	1,200	1,300	1,400	5,000
Action					External funds	Internal funds	Schedule	
To set up a dissemination protocol for activities carried out by CREAM.					3,900€	0 €	2015	
To add a Calendar section with a registration form including all activities of transfer, training and seminars in the new website.					0€	0€	2014	
To issue news related to CREAM's training programs.					0€	0€	2014-2017	

LINE 5. COMMUNICATION

OE 5.2 To boost the CREAM’s internal communication.

OO 5.2.1 To enhance procedures and workflows for CREAM’s internal information							Responsible agent Top management	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 5.2.1 Satisfaction survey for workers (Y/N)	Communication department	-	-	Y	-	-	Y	Y
Action					External funds	Internal funds	Schedule	
To promote the centre’s internal information newsletter.					0€	0€	2014-2017	
To set up a new Intranet, more user-friendly and intuitive.					0€	12,000€	2016	
To create a Welcome Guide for the centre. - PRIORITY ACTION					7,800€	0€	2015	

LINE 5. COMMUNICATION

OE 5.3 To promote the brand of the centre.

OO 5.3.1 To develop a CREAM brand according to its unique features							Responsible agent Communication	
Indicator	Responsible agent	P	VR	2014	2015	2016	2017	2014-2017
I 5.3.1 External survey on brand perception (Y/N)	Communication department	-	-	Y	-	-	Y	Y
Action					External funds	Internal funds	Schedule	
To define the unique features of CREAM. - PRIORITY ACTION					0€	0€	2015	
To create contents describing the centre and its unique features.					7,800€	0€	2015-2016	
To promote the use of the CREAM Corporate Identity Manual. - PRIORITY ACTION					7,800€	0€	2015-2017	
To adapt the corporate image of the centre's projects, activities and groups.					7,800€	0€	2015-2017	
To define the coexistence of the CREAM brand and the trustees' brand.					0€	0€	2016	

Follow-up of Strategic Plan

The management team will monitor the follow-up of the strategic plan. The following procedure will be carried out annually:

- Collection of annual values of the different indicators of the strategic plan by every responsible agent.
- Assessment of the compliance level of the plan comparing collected values and values in the Action Plan.
- Creation of a synthetic report on the balance of different monitoring indicators, highlighting indicators that have improved, completed or worsened forecast values, as well as possible causes for these deviations.

The annual report will be presented to the management board of CREAF. It will also be distributed among staff at the centre.