

PLAN



# Action Plan 2010-2013

Natural Resources  
Area

**EXECUTIVE SUMMARY**



N.B.: If you require any further information about the specific content of any particular Area 3 Centre or Institute's Strategic Plan, please ask for it by sending an e-mail to: [pe2010-13@csic.es](mailto:pe2010-13@csic.es). Thank you

# CONTENTS

|          |   |    |
|----------|---|----|
| <b>1</b> | General Information                             | 4  |
| <b>2</b> | Critical Analysis of the Area                   | 7  |
| <b>3</b> | Analysis of the Area's 2006-2009 Strategic Plan | 10 |
| <b>4</b> | Objectives for 2010-2013                        | 10 |
| <b>5</b> | Research Strategy and Proposed Actions          | 11 |

# 3 Natural Resources Area

## 1. GENERAL INFORMATION

### Description of the area

The CSIC's Natural Resources Area comprises 24 institutes charged with studying nature, and its structure and functioning. The area also performs research using various singular facilities, including oceanographic research vessels, such as the BIO Hespérides and the BIO Sarmiento de Gamboa, the Juan Carlos I Antarctic Station, and the field stations at the Doñana Scientific Reserve (Reserva Científica de Doñana) and Faro de Cap Ses Salines, and also holds major scientific collections such as that of the Real Jardín Botánico (Royal Botanic Garden) or the Museo Nacional de Ciencias Naturales (National Natural Science Museum). The area's research is grouped into three sub-areas: Biology of organisms and systems; Earth and atmospheric sciences; and, Marine sciences and aquaculture. The Area also has three transversal axes encompassing the interdisciplinary activities associated with research into global change, new technologies for observing nature, and the sustainability of natural resources.

### Short history

(Covering the period 2006-2009)

This section describes the main structural changes taking place in the Area over the period 2006-2009. In 2008 (1) the Instituto de Biología Evolutiva (Institute of Evolutionary Biology, IBE), a joint institute with the Universitat Pompeu Fabra and (2) the Instituto de Diagnóstico Ambiental y Estudios del Agua (Institute for Environmental Diagnosis and Water Studies, IDÆA), which is shared with the Chemical Science and Technology Area, were created in Barcelona. As a result of the reorganisation of the Earth and Atmospheric Sciences in Madrid during the period 2006-2009, it is envisaged that the Instituto de Geociencias (Institute of Geosciences, IGEO), a joint institute with the Madrid Complutense University, will come into operation in 2010. Also, in 2010 the Observatorio Geofísico del Ebro (Ebro Geophysical Observatory), at its own request, will leave the Physical Technologies and Sciences Area to become part of the Natural Resources Area. Moreover, during the period from 2006-2009 researchers in Earth Sciences at various institutes in Granada were brought under one roof at the Instituto Andaluz de Ciencias de la Tierra (Andalusia Earth Sciences Institute, IACT). The centres ceasing to belong to the Area during the period were the Instituto de Agroquímica y Tecnología de alimentos (Institute of Agrochemistry and Food Technology, IATA) in Valencia, the Instituto de Recursos Naturales de Salamanca (Salamanca

Institute of Natural Resources, IRNASA), the Estación experimental del Zaidín (Zaidín Experimental Station, EEZ) in Granada and the Centro de Edafología y Biología Aplicada del Segura (Segura Pedology and Applied Biology Centre, CE-BAS) in Murcia.

### **Mission and Vision**

#### **Mission**

The mission of the Natural Resources area is to contribute to our scientific understanding of Planet Earth and the creatures that inhabit it. To this end, the Area's main task is to perform high quality research that pushes back the frontiers of knowledge, while encouraging interdisciplinary collaborations inside and outside of the Area, promoting technology transfer, transmitting scientific knowledge and training new scientists.

#### **Vision**

The Natural Resources Area aspires to a leadership position in research in Spain into the natural environment and natural resources by creating a favourable atmosphere in which to generate the knowledge needed to achieve a sustainable balance between preserving our natural heritage and developing human activities. The Area also aims to become an international benchmark by providing substantive contributions to the general advancement of scientific knowledge of nature by producing significant new findings able to stimulate new trends in the discipline.

### **Institutes and Centres that comprise the Area**

#### **Institutes**

1. Blanes Centre for Advanced Studies (CEAB).
2. Centre for Research into Desertification (CIDE), Valencia.
3. Doñana Biological Station (EBD), Seville.
4. Arid Zones Experimental Station (EEZA), Almería.
5. Andalusia Earth Sciences Institute (IACT), Granada.
6. Torre de la Sal Aquaculture Institute (IATS), Castellón.
7. Barcelona Botanical Institute (IBB).

## Executive Summary

8. Institute for Evolutionary Biology (IBE), Barcelona.
9. Marine Sciences Institute (ICM), Barcelona.
10. Andalusia Marine Sciences Institute (ICMAN), Cádiz.
11. Jaume Almera Earth Sciences Institute (ICTJA), Barcelona.
12. Institute for Environmental Diagnosis and Water Studies (IDÆA), Barcelona.
13. Geosciences Institute (IGEO), Madrid.
14. Institute of Marine Research (IIM), Vigo.
15. Mediterranean Institute for Advanced Studies (IMEDEA) Mallorca.
16. Pyrenean Ecology Institute (IPE), Zaragoza.
17. Natural Produce and Agrobiology Institute (IPNA), Tenerife.
18. Institute for Research into Hunting Resources (IREC), Ciudad Real.
19. Natural Resources Institute (IRN), Madrid.
20. Seville Natural Resources and Agrobiology Institute (IRNAS).
21. National Natural Sciences Museum (MNCN), Madrid.
22. Ebro Geophysical Observatory (OE), Tarragona.
23. Royal Botanic Garden (RJB), Madrid.
24. Marine Technology Unit (UTM), Barcelona.

### **Centres:**

1. Environmental Sciences Centre (CCMA), Madrid. This centre comprises the IRN and the Agricultural Sciences Institute (ICA) from the Agricultural Sciences Area.
2. Centro Mediterráneo de Investigaciones Marinas y Ambientales (Mediterranean Centre for Marine and Environmental Research, CMIMA), Barcelona. Centre comprising the ICM and UTM.

### **Unique Scientific and Technological Infrastructure (ICTSs):**

1. Juan Carlos I Antarctic Base (BAJC)
2. Hespérides Oceanographic Research Vessel (BIOH)
3. Sarmiento de Gamboa Oceanographic Research Vessel (BIOSG)
4. Doñana Scientific Reserve (RCD)

## 2. CRITICAL ANALYSIS OF THE AREA

### SWOT ANALYSIS

#### Weaknesses

- Difficulty of managing projects and contracts due to bureaucratic restrictions.
- Shortage of research support personnel.
- Lack of proportion in the size of the institutes.
- Inflation of the number of research lines.
- Lack of cooperation between research groups.
- Minimal awareness of research carried out in other Areas.
- Lack of investment in common infrastructure shared by more than one institute.
- Low level of technology transfer.

#### Threats

- Possible stagnation due to the global economic crisis
- Limited mobility of researchers and support personnel between institutes.
- Decline in leadership and participation in major national and international scientific projects.
- Loss of competitiveness vis-à-vis institutions with better management models and greater flexibility to adapt to changes.
- Impossibility of accessing latest-generation equipment and technologies.
- Interruption in the collection of long-term time series data.

#### Strengths

- Staff researchers with an excellent global profile and leadership, a high level of good quality scientific output and presence on decision-making bodies of international scientific organisations and panels.
- Adaptation of research line objectives to address highly topical scien-

## Executive Summary

tific and social issues, such as global change, nature conservation, forecasting and preventing natural risks, evaluating natural resources, evaluating and mitigating environmental problems, etc.

- Multidisciplinary nature of the Area (physics, chemistry, biology, geology), with considerable potential for synergies if it is possible to encourage collaboration between groups.
- Upward trend in the internationalisation of the Area's research workforce.
- Strong capacity for training of young researchers in the framework of the CSIC's own scientific career structure.
- Availability of large facilities (oceanographic vessels, field stations, long-term time series and scientific collections of natural history specimens), representing a competitive advantage.
- High potential for obtaining resources through participation in projects with government bodies and companies.

### **Opportunities**

- The existence of strategic plans should enable specific actions to create, merge or eliminate institutes according to the Area's needs.
- The use of the research line as a unit of action should make it possible to raise competitiveness.
- Transfer of attributes to institutes' directors should enhance their management capacity.
- The development of the CSIC as a State Agency should make administrative and management mechanisms more flexible and enable the research support staff to be strengthened.
- The scenario of global change which the planet is undergoing makes the Area the centre of attention.
- Bolstering multidisciplinary groups and the use of major facilities should increase the Area's international profile.



## HORIZONTAL ANALYSIS OF THE RESEARCH LINES

The Natural Resources Area's research lines are grouped into thematic areas through each of the following sub-areas:

| Thematic areas |  |
|----------------|--|
|                | <b>Biology of Organisms and Systems</b>                  |
| 1              | Biodiversity and evolutionary biology                    |
| 2              | Fundamental ecology                                      |
| 3              | Conservation and sustainable use of biological resources |
|                | <b>Earth and atmospheric sciences</b>                    |
| 4              | Geohydrosphere processes                                 |
| 5              | Desertification and soil conservation                    |
| 6              | Structure, dynamics and evolution of the Earth           |
| 7              | Conservation and sustainable use of geological resources |
|                | <b>Marine Sciences and Aquaculture</b>                   |
| 8              | Marine geosciences                                       |
| 9              | Oceanographic processes                                  |
| 10             | Marine aquaculture                                       |
| 11             | Conservation and sustainable use of marine resources     |
|                | <b>Transversal axes</b>                                  |
| 12             | Global change  |
| 13             | New technologies for the observation of nature           |
| 14             | Sustainability of natural resources                      |

### **3.ANALYSIS OF THE AREA'S 2006-2009 STRATEGIC PLAN**

The 2006-2009 Strategic Plan was the first such plan to be prepared by the CSIC, and preceded the CSIC's formal transformation into a State Agency. The period from 2006-2008 was generally better than initially expected, both in terms of the objectives achieved and resources obtained. The Strategic Plan was therefore fulfilled overall, even taking into account the marked drop in resources in 2009 as a result of the global economic crisis. As regards the level of fulfilment of objectives, it is necessary to distinguish between quantitative targets (number of high impact publications, income obtained, doctoral theses supervised), which in general the institutes have met correctly, and the qualitative aims (increased interdisciplinary collaboration, competitiveness and international visibility), where the record was more mixed.

### **4.OBJECTIVES 2010-13**

#### GENERAL OBJECTIVES

- Creating incentives cutting-edge basic and applied research, which necessarily lead to high impact publications.
- Bolstering and positioning the Area's institutes and research lines as national and international benchmarks.
- Activating the transmission of scientific knowledge generated to society (popularisation and outreach), to new generations of researchers (training), and the productive sector (technology transfer).

#### SPECIFIC OBJECTIVES

- Raising the average quality of research in the Area.
- Matching research by the lines to the mission of the Institutes.
- Encouraging relationships between institutes and focusing their mission.
- Supporting interdisciplinary collaboration.
- Prioritising research into topics with significant social and economic impact.
- Stimulating risk research.
- Promoting the incorporation of foreign researchers.

- Strengthening research groups' training potential.
- Bolstering leadership positions in Europe and the rest of the world.

### INTEGRATION WITH THE STRATEGIC AXES DEFINED FOR 2010-2013

The Natural Resources Area plays a key role in two of the CSIC's strategic axes. (1) Global change. Given that natural processes are interrelated and operate at global level, the Area has a horizontal research axes focusing on global change, in which various research lines approach the study of the anthropic effect on nature and how to mitigate it and adapt to it from different perspectives. (2) Water resources. The origins of desertification processes are linked to man's actions (deforestation, poor agricultural practices and overgrazing), which translate into soil degradation (physical erosion, physical degradation, salinisation, etc.) and/or destruction of plant cover. The vulnerability to desertification depends on the climate, relief, soil condition and vegetation, in conjunction with the management of natural resources, requiring a multidisciplinary approach.

## 5. RESEARCH STRATEGY AND ENVISAGED ACTIONS

### Lines

The Area's strengths lie in those research lines identified as being competitive at the international level and which present scientific output indicators that are high both in quantitative and qualitative terms. These research lines include scientists of international standing who are leaders in their respective disciplines and members of editorial committees and international forums. Therefore, these lines are priorities in the Area and should be strengthened with the human and economic resources necessary to support them and maintain them at their current international standing. Their performance should serve as a model for the other Areas.

### Institutes

Improving the Institutes' scientific performance entails making administrative procedures more flexible (one of the aspects to develop as a State Agency) and considerably increasing the numbers of research support personnel, including both administrative and technical personnel (an issue envisaged in the 2010-

## Executive Summary

2013 Strategic Plan). It will be important for the Institutes to be able to bolster their cohesion around their scientific project, identify their scientific goals, and identify which research lines contribute most to the institute's mission, so as to give them priority. This makes it necessary for institutes to define their mission, and their profile within the framework of the general structure of the CSIC clearly and, as far as possible, avoid administrative fragmentation between areas.

### **Implementation of the strategy (envisaged actions).**

The Strategic Plan is a tool enabling specific actions to be implemented with a view to improving the Area's organisation, focusing the Institutes' mission and enhancing research quality and performance. The most significant actions envisaged in the Area are:

- Actions to bolster the most competitive lines.
- Actions to enable recently created institutes to become established.
- Actions to specify researchers' Area.
- Actions to align research to the Institute's mission.
- Actions to avoid research becoming fragmented.
- Actions to promote harmonisation and raise the competitiveness of the various disciplines.
- Actions to reduce the inequalities in size between the institutes.
- Actions to improve the efficiency of the transversal axes.
- Actions to structure the Area's multidisciplinary.
- Actions to improve integration within the mixed institutes.
- Actions to promote the use of shared facilities.
- Actions to facilitate technology transfer and dissemination.

## Executive Summary

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