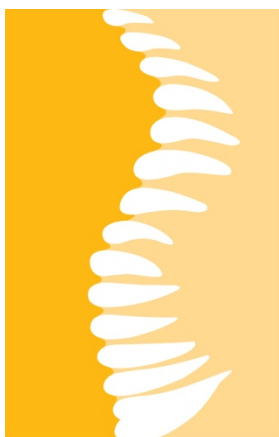


ANNUAL REPORT

2018

March 2019



ICP ^R

Institut Català de Paleontologia
Miquel Crusafont

ANNUAL REPORT 2018

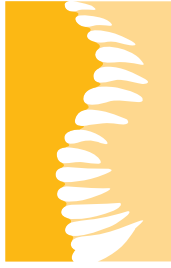
INSTITUT CATALÀ DE PALEONTOLOGIA MIQUEL CRUSAFONT



DAVID M. ALBA

Director

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ICP^R

Institut Català de Paleontologia
Miquel Crusafont

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Universitat Autònoma de Barcelona.

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Patrons:



**Generalitat
de Catalunya**

UAB

**Universitat Autònoma
de Barcelona**

Member of:



WELCOME TO THE ICP

Greetings from the Director

At the ICP we are convinced that Paleontology, as a discipline halfway between Biology and Geology, should make fundamental contributions not only to the history of life, but also to evolutionary theory. Therefore, the research performed at the ICP clearly follows a paleobiological approach. In other words, for us it is not enough to know how past living beings were and what are their kinship relationships with extant ones. We also aim to know how they lived, how they moved, what they ate, how they developed and reproduced, how they interacted with one another, what environment they inhabited and, ultimately, how past interactions between organisms and environment have shaped the ecosystems that we know today. It is precisely the access to deep time (or geological time, the one which is measured in millions and millions of years), by means of the study of fossil remains, what provides Paleobiology with a unique perspective of utmost importance for understanding why and how living beings have evolved in relation to the environment that surrounds them through Earth's history.

For our research team, it is important to perform all the various steps of paleontological research, beginning with fieldwork (excavations and samplings), continuing with the study and analysis of fossil remains, and ending with the publication and dissemination of the results. In these regards, the basic task of description and taxonomic identification of the remains is still an essential aspect of our work. However, more and more, the study and analysis of the fossils is carried out using more sophisticated and computer-assisted techniques. Most noteworthy among them are virtual paleontology and three-dimensional visualization techniques, such as X-ray computed tomography, which enables the non-invasive study of the internal anatomy preserved by fossil remains. Also particularly remarkable are the analytical techniques allowing for quantitative comparisons and analyses, such as 3D geometric morphometrics, phylogenetic reconstruction software, or numerical analyses of paleobiodiversity dynamics, just to mention a few examples.

The specialized technicians of the ICP, in turn, perform a fundamental step between fieldwork and research, consisting in the preparation and conservation of the fossil remains that constitute the paleontological collections of our Institute. These collections are continuously growing thanks to the excavations and samplings performed by our researchers. However, before being able to study a particular specimen, it is required that specialized technicians carry out a process of paleontological preparation (cleaning, consolidation and, if necessary, reintegration). The process of paleontological preparation not only enables the manipulation of fossils, but it also guarantees their proper conservation once deposited in the collections. This process is of utmost significance, given that fossils are our main source of data. In this regard, the ICP aims to become the benchmark center in Catalonia with regard to

the conservation of the paleontological heritage of vertebrates. This is why we offer our technical advice, in this and any other paleontological matter, to those institutions and companies that request it.

Besides paleontological research, preparation and conservation, at the ICP we further place particular importance to outreach activities to popularize paleontological heritage. In this regard, exhibiting the fossils is not enough; it is required to disseminate to the general public our research results, so as to make understandable the stories that hide in all these petrified bones. Transmitting paleontological knowledge to society, especially based on the finds and research results of our investigators, is for us a heartwarming moral obligation. In the words of the late North-American paleontologist Stephen Jay Gould: "Science is an integral part of culture. It's not this foreign thing, done by an arcane priesthood. It's one of the glories of the human intellectual tradition". This is why at the ICP we have the vocation to make it available to those who are interested the conceptual and material tools that enable a cultural and ludic use of paleontological heritage. And we do so not only by means of the exhibition halls of the ICP Museum, located at the center of Sabadell, but also by collaborating in the establishment and management of a network of local paleontological interpretation centers all over the country. Moreover, at these times of rampant antiscientific and creationist offensive, we feel a duty to help disseminating one of the most relevant scientific facts to comprehend the place of human being in nature: organic evolution.

I do not want to finish without addressing those youngsters that, captivated by the secrets of evolution, perceive the grandeur in this view of life (the one alluded by Charles Darwin on the last sentence of the Origin of Species) and aim to devote themselves to Paleontology. Becoming a researcher, from any discipline, is not an easy task... It requires a lot of study, tenacity, and sacrifice. And yet, if your fascination for fossils and your curiosity for evolution transcend any logical argument, if it is already too late for you, then I can only advise you to let yourselves be guided by your vocation. That you get trained in life and earth sciences, that you be ambitious and realistic at the same time, and that you try to put your talent at the service of paleontological research. You, as young people, are the future, not only of the ICP, but of the paleontological profession and of the scientific community as a whole. And only you, if you choose the correct questions, might hope to answer the multiple enigmas about the history of life that thus far remain unsettled.

With my warmest greetings,



David M. Alba
Director

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FOREWORD

Let's get to work

While 2017 was a year of turnover and planning at the Institut Català de Paleontologia Miquel Crusafont (ICP), following the replacement of the former Director and the design of new policies and strategic aims for years to come, 2018 has been a year of very intense work. In this regard, I feel most thankful to all ICP personnel for the additional effort made, and particularly to those persons that hold responsible positions and/or have actively contributed to the governance of the ICP by means of participating in its various committees and commissions. Most invaluable have been the guidance and support by the various members of the Steering Committee, so thank you all!

A year ago I asserted that planning and foreseeing were required to take the ICP out of the 'survival model' in which it had been installed for several years, following the budget downsizing caused by the economical crisis. I warned that much work remained to be done and that a balance between realism and ambitiousness was required. This is why we devoted a lot of efforts in 2017 to the confection of a new Strategic Plan (2018-2021) as well as an Action Plan toward the implementation of human resources excellence in research. With the Human Resources Excellence Award of the EU granted to the ICP in March 2018, and the ICP Strategic Plan also presented during the first quarter of the year and subsequently approved by the Board of Trustees, it was time to devote most of the efforts to the implementation of the necessary actions. One of the most notorious is the ICP recruitment protocol, which has been drafted during 2018 and hopefully will be approved in 2019.

Also very relevant for the immediate future of the ICP is the evaluation performed by the CERCA institution, by means of the designation of an Evaluation Commission including both external reviewers and members of the ICP Advisory Board. The results of such an evaluation are quite satisfactory, in the sense that in spite of some shortcomings that precluded attaining the highest possible qualification, they confirm that the ICP is performing well and, most importantly, the various measures devised to improve are considered adequate.

I am fully convinced that the ICP is on the right track to fix its current minor drawbacks that we will be able to significantly improve further our performance in the near future. The failure to get the highest qualification will not detract me from my firm conviction that the enormous effort performed by ICP personnel during the last years undoubtedly deserves it, and rather constitutes a stimulus for my enduring will to consolidate further the ICP as one of the most prominent and leading institutions in vertebrate and human paleobiology worldwide.

PART 1

OVERVIEW OF THE ICP

Established as a CERCA center in 2006, the ICP is the heir of a longstanding tradition of vertebrate paleontology research in Catalonia. It owes its existence to several succeeding generations of paleobiologists devoted to deciphering the intricacies of the history of life based on the extraordinary fossil record from Catalonia. Our mission is focused on research, conservation and dissemination of vertebrate and human paleontology at the highest international level.

INTRODUCTION

Research, conservation, and dissemination in vertebrate paleontology

History

The Institut Català de Paleontologia Miquel Crusafont (ICP) is the heir of a longstanding tradition of vertebrate paleontology research in Catalonia. It owes its existence to several succeeding generations of paleontologists that have devoted their professional careers to decipher the intricacies of the history of life and the paleobiology of extinct organisms based on the extraordinary Catalan fossil record.

The ICP is the successor of the former Instituto Provincial de Paleontología de Sabadell (IPS), founded in 1969 under the auspices of the Diputació de Barcelona thanks to the efforts and charisma of paleontologist Miquel Crusafont—the ‘father’ of the Catalan school of vertebrate paleontology. After being renamed in his honor after Crusafont’s decease in 1983, and coinciding with the incorporation of a new generation of researchers, the Institut de Paleontologia M. Crusafont witnessed a couple of successful decades. Nonetheless, by the early 2000s it was in peril of becoming a local museum and its prospects were most uncertain.

The situation of the IPS was reverted in 2006, thanks to the refoundation of the ICP within the framework of the CERCA program (Research Centers of Catalonia) of the Generalitat de Catalunya. The last decade has been most successful in terms of research, but not exempt of problems due to the effects of global financial crisis since 2012, which have restrained the growth of the ICP and the implementation of several other aspects.

Mission

Our mission is focused on research, conservation and dissemination of vertebrate and human paleontology at the highest international level. We perform research based on the following premises:

- Fieldwork and collection-based research, focused on the extraordinarily rich fossil vertebrate record from Catalonia.
- Adherence to a paleobiological approach that departs from the classical descriptive paleontology (oriented toward stratigraphy), and instead aims to test evolutionary and macroecological hypotheses within the framework of life sciences.
- The use of modern visualization and analytical techniques (from CT to paleohistology).
- The distinction of different research groups, each one with clear research aims and scope.

Other important aspects of our mission include:

- The conservation of the paleontological heritage of Catalonia.
- The communication of the research results to the general public by means of scientific dissemination.

- The transfer of paleontological knowledge to the benefit of society as a whole by means of training and outreach activities, as well as the provision of services.

Scientific view

Our view of paleontological research is based on the following premises:

- A modern approach to paleontological research must be grounded on the paleobiological approach, which envisions paleontology as deeply entrenched among life sciences.
- Among life sciences, paleobiology has a voice of its own by uniquely providing direct access to life in the past, thereby adding a deep-time perspective that is essential for testing hypotheses on a geological timescale.
- Paleobiology is not only an idiographic (descriptive) discipline that contributes to the progress in the knowledge of the history of life on Earth, but also a nomothetic discipline based on a rigorous and quantitative hypothesis-testing framework.
- Paleobiological research must be therefore guided by clear research aims and specific hypotheses to be tested.
- Vertebrates have the greatest potential among continental animals and therefore the study of their fossil record is most promising for investigating the evolution of terrestrial ecosystems in relation to paleoenvironmental changes through time.
- Although paleobiology is mostly devoted to basic (fundamental) research, it has important implications for other disciplines among life sciences, such as evolutionary biology, ecology and conservation (paleo)biology.
- Furthermore, paleobiological research is not devoid of applicability and has a great potential with regard to knowledge transfer related to cultural heritage.
- Finally, human origins and evolution need to be approached following the same scientific methods as that for any other group of animals, as regularly done in the subdisciplines of paleoprimatology and paleoanthropology.

Vision

The ICP vision includes the following challenges:

- Perform high-impact paleobiological research at the international level.
- Promote the international visibility of the ICP as a worldwide renowned and benchmark center in vertebrate paleontology and paleoanthropology research.
- Contribute to the recuperation, conservation and dissemination of the paleontological heritage of Catalonia, including its valorization through research and the promotion of paleontological tourism based on it.
- Contribute to solving current societal challenges, with emphasis on the development of more efficient environmental policies to face climatic change, by means of providing data on a geological timescale as well as by testing macroecological and evolutionary hypotheses.

- Make paleontological knowledge and its evolutionary implications accessible to the society as a whole, by means of scientific dissemination, outreach, and training activities, with emphasis on humankind's origins and place in nature.
- Perform knowledge transfer activities by providing specialized paleontological services to research and educational institutions, public administrations, and private companies.

ORGANIZATION

Research groups, research support, communication and management

Legal structure

The ICP is a public research institute established as a non-profit foundation endowed with public funds, with the Generalitat de Catalunya and the Universitat Autònoma de Barcelona as patrons. The staff is composed of ca. 50 people (researchers, technicians and administrative staff), including a Director and a General Manager with executive powers delegated by the patrons. As currently conceived, the ICP is an autonomous research institute from the CERCA institution (Research Centers of Catalonia), which has scientific excellence as its main objective. It is supervised by its patrons and an external Scientific Advisory Board, and guided by a Director, who plans the scientific policy and strategic goals.

Organization chart

A new Organization Chart, proposed by the Director, was approved by the Steering Committee in late 2017 and subsequently ratified by the Board of Trustees in 2018, with the aim to facilitate the coordination between technical areas toward the attainment of common strategic goals. An update of this Organization Chart, with minor adjustments, was also approved in late 2018 by the Steering Committee.

The hierarchical structure of our organization can be subdivided into the following bodies:

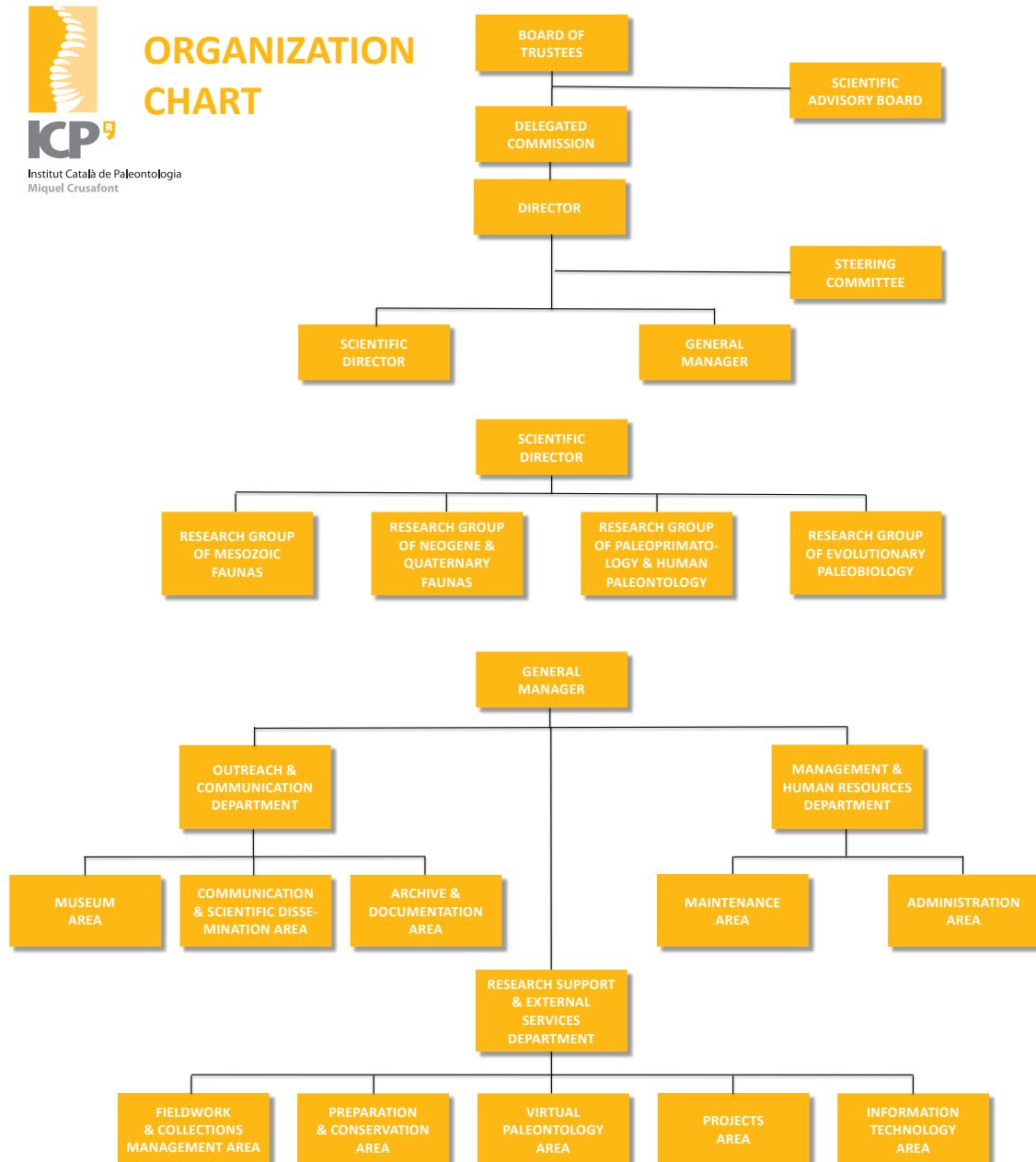
- Governing organs.
- Executive positions.
- Research groups.
- Technical departments.

GOVERNING ORGANS	EXECUTIVE POSITIONS	RESEARCH GROUPS	TECHNICAL DEPARTMENTS
Board of Patrons	Scientific Directorship	Mesozoic Faunas	Outreach & Communication
Delegated Commission	General Managership	Neogene & Quaternary Faunas	Management & Human Resources
Scientific Advisory Board	Steering Committee	Paleoprimatology & Human Paleontology	Research Support & External Services
Directorship		Evolutionary Paleobiology	

Governing organs

- Board of Trustees: It is the highest governing, administrative and representative organ, without prejudice that some of its functions may be delegated.
 - Delegated Commission: Designated by the Board of Patrons to delegate some of its functions.

- **Scientific Advisory Board:** Advisory organ designated by the Board of Trustees.
- ✓ **Director:** Designated by the Board of Trustees.
 - **Steering Committee:** Consulting and decision-making organ, designated by the Director.
 - **Scientific Director:** Designated by the Director (if different).
 - **Managership:** Designated by the Director.



Board of Patrons. It is composed of five patrons: three from the Generalitat de Catalunya (60%) and two from the Universitat Autònoma de Barcelona (UAB, 40%). Two patrons are permanent and three are designated.

BOARD OF PATRONS		
TYPE	POSITION	NAME
Permanent	Minister from the Generalitat de Catalunya in charge of research	Àngels Chacón
Permanent	Rector of the UAB	Dr. Margarita Arboix Arzo
Designated	Secretary of Universities and Research, Generalitat de Catalunya	Dr. Francesc Xavier Grau
Designated	Director General of Research, Generalitat de Catalunya	Dr. Joan Gómez Pallarès
Designated	A Vice-Rector of the UAB	Armand Sánchez Bonastre

The main functions of the Board of Trustees are the following:

- Approval of our annual budget and investment plan, inventory, and annual financial accounts, ensuring the accomplishment of the endowment and the correct destination of our assets to our foundational aims.
- Highest representation and definition of our general program of action.
- Appointment of the Director, of the General Manager (upon proposal by the Director), the President of the Delegated Commission, and the President of the Scientific Advisory Board, and establishment of the remuneration of executive positions.
- Hiring of works, services and supplies, and approval of the rules of internal functioning, collaboration agreements with other entities, etc.

Scientific Advisory Board. It is constituted by seven senior researchers from several countries, including Spain, France, Italy and the USA.

SCIENTIFIC ADVISORY BOARD		
TYPE	NAME	AFFILIATION
President	Prof. José Luis Sanz	Universidad Autónoma de Madrid, Spain
Member	Prof. Michel Brunet	Université de Poitiers, France
Member	Prof. Jorge Morales	Museo Nacional de Ciencias Naturales-CSIC, Spain
Member	Prof. Brian McNab	University of Florida, USA
Member	Prof. David Pilbeam	Harvard University, USA
Member	Prof. Lorenzo Rook	Università di Firenze, Italy
Member	Prof. Elisabeth Vrba	Yale University, USA

The main functions of the Scientific Advisory Board are the following:

- Providing advice with regard to our scientific activities.
- Participation in the periodic evaluation of the ICP.
- Eventual participation in specific advisory commissions.

Executive and managerial hierarchy

- **Director:** Dr. David M. Alba.
 - **Steering Committee:** Director, General Manager, Heads of Department.
 - **Scientific Director:** Dr. David M. Alba.
 - ✓ **Research Groups:**
 - **Mesozoic Faunas:** Dr. Àngel Galobart (Head of Group).

- Neogene & Quaternary Faunas: Dr. David M. Alba (Head of Group).
- Paleoprimatology & Human Paleontology: Prof. Salvador Moyà-Solà (Head of Group).
- Evolutionary Paleobiology: Prof. Meike Köhler (Head of Group).
- General Manager: Enric Menéndez.
 - ✓ Departments:
 - Outreach & Communication: Pere Figuerola (Head of Dept.).
 - Management & Human Resources: Enric Menéndez (Head of Dept.).
 - Research Support & External Services: Dr. Josep Fortuny (Head of Dept.).

Both the Director and the General Manager have multiple functions and responsibilities, including some specific of these positions, as well as others delegated by the Board of Trustees.

The Director. In brief, the Director has chief executive officer functions, including the direction, organization management, execution and inspection of our research activities, and well as the determination of the strategic aims of the ICP and the proposal of a Strategic Plan to the Board of Trustees. The Director is appointed by the Board of Trustees following an open, transparent and merit-based selection process at the international level.

The General Manager. In turn, the General Manager has chief administrative officer functions, including the financial, accounting and treasury management, as well as administrative contracting and preparation of the documentation required to elaborate the annual accounts and balance sheet. It is appointed by the Board of Trustees upon proposal by the Director.

Committees and commissions

The ICP has several committees and commissions, aimed to boost the internal coordination as well as to promote the participation of the ICP staff in decision-making.

Committees. They are the following:

- **Steering Committee:** Involved in planning, organizational, foresight, strategic, decision-making and advisory functions.
- **Information Systems Security Committee:** Involved in guaranteeing the security of information systems, the safeguard of data, and the fulfillment of personal data protection laws.
- **HRS4R Implementation Committee & Working Group:** Involved in the implementation of the Human Resources Strategy for Researchers (HRS4R) of the European Union.

- **Non-Discrimination Committee:** Involved in the improvement and implementation of the Equality Plan.

STEERING COMMITTEE		
POSITION	NAME	ICP POSITION
Chair	Dr. David M. Alba	Director
Vice-Chair	Enric Menéndez	General Manager
Rapporteur	Pere Figuerola	Head of the Outreach & Communication Dept.
Member	Dr. Josep Fortuny	Head of the Research Support & External Services Dpt.

INFORMATION SYSTEMS SECURITY COMMITTEE		
POSITION	NAME	ICP POSITION
Chair	Dr. David M. Alba	Director
Rapporteur	Pere Figuerola	Head of the Outreach & Communication Dept.
Member	Enric Menéndez	General Manager
IT External Consultant	Josep Torres	External

HRS4R IMPLEMENTATION COMMITTEE & WORKING GROUP		
POSITION	NAME	ICP POSITION
Chair	Enric Menéndez	General Manager
Vice-Chair	Dr. David M. Alba	Director
Rapporteur	Xènia Aymerich	Head of the Preparation & Conservation Area
Member	Laila Pilgren	Project Manager
Member	Pere Figuerola	Head of the Outreach & Communication Dept.
Member	Teresa Esquirol	Head of the Museum Area
Member	Dr. Judit Marigó	Rapporteur of the Researchers Commission

NON-DISCRIMINATION COMMITTEE		
POSITION	NAME	ICP POSITION
Chair	Xènia Aymerich	Head of the Preparation & Conservation Area
Vice-Chair	Laila Pilgren	Project Manager
Rapporteur	Pere Figuerola	Head of the Outreach & Communication Dept.
Member	Dr. Judit Marigó	Rapporteur of the Researchers Commission

Commissions. They are the following:

- **Researchers Commission:** Involved in providing advice to the Director, the Steering Committee, and other committees on HRS4R implementation and other aspects related to researchers.
- **Fieldwork Commission:** Internal coordination of resources for paleontological fieldwork performed and provision of external services to third parties.

RESEARCHERS COMMISSION		
POSITION	NAME	ICP POSITION
Chair	Dr. Salvador Moyà-Solà	Representative of R4 (senior experienced researchers)
Vice-Chair	Dr. Albert Prieto-Márquez	Representative of R3 (experienced researchers)
Rapporteur	Dr. Judit Marigó	Representative of R2 (postdoctoral researchers)
Member	Sílvia Jovells-Vaqué	Representative of R1 (predoctoral researchers)

FIELDWORK COMMISSION		
Chair	Dr. Josep Fortuny	Head of the Research Support & External Services Dpt.
Vice-Chair	Dr. Josep M. Robles	Fieldwork Officer
Rapporteur	Jordi Galindo	Head of the Fieldwork Management Area

PERSONS IN CHARGE		
Information Systems Security	Pere Figuerola	Head of the Outreach & Communication Dept.
Ombudsperson	Laila Pilgren	Project Manager
Ombudsperson	Pere Figuerola	Head of the Outreach & Communication Dept.
University Teaching Coordination	Dr. Marc Furió	Researcher

Coordination meetings. In parallel to the meetings of the established committees and commissions, coordination meetings will take place on a quarterly basis, including the Director, the General Manager, the Heads of Research Groups, Departments and Areas, and the persons in charge of remaining Areas.

Persons in charge. Some staff members have specific functions in addition to those corresponding to their respective positions in the Organization Chart or in the committees and commissions:

- Person in charge of Information Systems Security.
- Ombudspersons.
- Person in charge of University Teaching Coordination.

Personnel

Our personnel can be divided into the following categories:

- **Staff sensu stricto:** Either tenured (with a permanent contract), temporary (with a fixed-term contract), or in tenure-track (with a fixed-term contract that may become permanent).
 - ✓ **Own staff:** With a contractual employment relationship with the ICP.
 - ✓ **Seconded staff:** With a contractual relationship with other institutions (civil servants from the Generalitat de Catalunya, research professors from the Institució Catalana de Recerca i Estudis Avançats), but ascribed to the ICP.
- **Other personnel:** Without a contractual relationship or formal ascription to the ICP:
 - ✓ **Research Associates:** With a written agreement that implies ICP affiliation.
 - ✓ **Research Collaborators:** With a verbal agreement that implies ICP affiliation, including grantees (scholarship holders without a contractual relationship with the ICP) and PhD students without grant.
 - ✓ **Other:** Trainees, visiting researchers, master and bachelor students, volunteers, etc.

Researcher categories. We distinguish several professional categories of researchers based on the EU researcher profiles (R1–R4) specified on the European Framework for Research

Careers of the European Union. They are divided into early-stage researchers (R1 & R2) and experienced researchers (R3 & R4):

- **R1:** First Stage Researchers (up to the point of PhD).
- **R2:** Recognized Researchers (PhD holders not yet fully independent).
- **R3:** Established Researchers (with a certain level of independence).
- **R4:** Leading Researchers (leaders in their area or field).

RESEARCHER CATEGORIES			
ICP CATEGORY	PROFILE	TYPE	TYPE OF CONTRACT
Predocctoral Researcher	R1	Early-stage	ICP predoc / External agency fixed-term (e.g., FI, FPI, FPU)
Postdoctoral Researcher	R2	Early-stage	ICP postdoc / External agency fixed-term (e.g., JdC, BP, ERC Starting Grant)
Researcher	R3	Experienced	ICP tenured or tenure-track / Civil servant / External agency tenure-track (e.g., RyC, ERC Consolidator Grant)
Senior Researcher	R4	Experienced	ICP distinguished researcher / Civil servant / External agency permanent (e.g., ICREA, ERC Advanced Grant)
Research Collaborator	R1	Early-stage	Verbal agreement
Research Associate	R2–R4	Early-stage/ Experienced	Written agreement
Lab Technician	R1	Experienced	ICP technician / External agency fixed-term (e.g., PTA)

RESEARCH

Four research groups with definite aims and scope

Scientific policy

Main guiding principles. The research performed at the ICP pivots on the following three main guiding principles:

- Collection- and fieldwork-based research focused on the study of fossils as the main source of raw data, with emphasis on the rich and varied vertebrate fossil record from Catalonia—especially for the Permo-Trias, the Late Cretaceous, the Eocene, the Miocene, and the Pleistocene—and with particular relevance of the paleoichnological record of the latest dinosaurs from Europe and the extraordinary record of Miocene apes.
- A paleobiological approach that clearly situates paleontology well within the framework of life sciences in general, and of evolutionary biology in particular, and which emphasizes a quantitative and nomothetic approach based on hypothesis testing—thereby far from the more classical descriptive approach to paleontology (largely oriented toward its stratigraphic implications).
- The application of modern techniques and methodological approaches to paleontological research, such as paleohistological analysis to infer the life-history of extinct organisms, computer-assisted imaging techniques that enable the non-invasive study of internal anatomy, or theoretical approaches to quantitatively analyze the dynamics of paleobiodiversity through time.

Research groups. The research performed at the ICP is organized around four research groups, which are coordinated and supervised by the Scientific Director. They are the following:

- Mesozoic Faunas (led by Dr. Àngel Galobart).
- Neogene and Quaternary Faunas (led by Dr. David M. Alba).
- Paleoprimatology & Human Paleontology (led by Dr. Salvador Moyà-Solà).
- Evolutionary Paleobiology (led by Dr. Meike Köhler).

Each group is led by the corresponding leader (research group head, which is a senior researcher, R4), and may include other (experienced) researchers (R3), and/or postdoctoral researchers (R2), predoctoral researchers (R1), as well as research associates, collaborators and technicians. However, most technicians are affiliated to a technical department instead of a research group. In turn, a few researchers are simultaneously or exclusively affiliated to the semitechnical Virtual Paleontology Area led by Dr. Josep Fortuny.

Mesozoic Faunas

The research group in Mesozoic Faunas focuses on the paleobiodiversity and paleoecology of terrestrial ecosystems during the Mesozoic era (252-66 Ma), with emphasis on those time intervals best represented in the fossil record of Catalonia, which include the Permo-Trias and the latest Cretaceous. Both the Permian-Triassic and the Cretaceous-Tertiary boundaries reflect important mass extinction events that took place, respectively, at 252 Ma (end-Permian extinction or 'Great Dying') and 66 Ma (K-T extinction). These mass extinctions wiped out a large proportion of terrestrial vertebrates (including the disappearance of non-avian dinosaurs at the K-T extinction), and therefore the study of the associated paleoecological changes at the community level is of utmost relevance. To a large extent, the research performed by this group builds on the extraordinary fossil record from the Catalan Pyrenees of the latest dinosaurs from Europe and the associated fauna. Besides bony remains, the former also consists of an exceptional paleoichnological record (including eggs, tracks and even skin impressions), which overall provides a unique window to dinosaur paleobiology. Furthermore, the group takes a multidisciplinary approach that, besides paleontologists specializing in several groups and ichnological remains, also involves paleobotanists and geologists specializing in stratigraphy and paleomagnetism, in order to provide with accurate datings and paleoenvironmental reconstructions.

RESEARCH GROUP OF MESOZOIC FAUNAS				
NAME	POSITION	CATEGORY	PROFILE	TYPE OF CONTRACT
Dr. Àngel Galobart	Research Group Head	Senior Researcher	R4	Civil Servant (GC)
Dr. Albert Prieto-Márquez	'Ramón y Cajal'	Researcher	R3	Tenure-track (GE)
Dr. Bernat Vila*	Postdoc	Postdoctoral Researcher	R2	Fixed-term (ICP)
Dr. Albert G. Sellés*	Postdoc	Postdoctoral Researcher	R2	Fixed-term (ICP)
Rafel Matamales-Andreu	FPU Predoc	Predocctoral Researcher	R1	Fixed-term (AGAUR)
Dr. Fabio M. Dalla Vecchia§	Researcher	Research Associate	R3	—
Dr. Nicolas Malchus	Researcher	Research Associate	R3	—
Dr. Víctor Fondevilla§	Postdoc	Research Associate	R2	—
Joan Cartanyà	Freelance	Research Collaborator	R1	—

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Neogene & Quaternary Faunas

The research group of Neogene & Quaternary Faunas focuses on the paleobiodiversity of continental vertebrates of the Neogene (23.0–2.6 Ma) and Quaternary (2.6–0.0 Ma) periods, with emphasis on the rich Miocene and Pleistocene record from the Vallès-Penedès Basin. Besides investigating the evolutionary history of various vertebrate groups from a phylogenetic and paleobiological perspective (the latter including dietary, locomotor and cognitive adaptations), the group further takes a more holistic approach by focusing on the dynamics of paleobiodiversity in relation to global climate change and local paleoenvironmental indicators through time. In relation to the latter, both the Miocene and the Pleistocene record important

faunal turnover events—such as the Vallesian Crisis and the Mid-Pleistocene Revolution, respectively. Therefore, the extraordinarily complete, abundantly sampled and accurately dated vertebrate record from these periods in the Vallès-Penedès Basin provides a unique opportunity to test evolutionary paleoecological hypotheses on the mechanisms and interactions between biotic and abiotic factors that drive the course of evolution on a geological timescale—with significant implications to predict the future and future viability of extant terrestrial ecosystems in the light of current global climate change.

RESEARCH GROUP OF NEOGENE & QUATERNARY FAUNAS				
NAME	POSITION	CATEGORY	PROFILE	TYPE OF CONTRACT
Dr. David M. Alba	Research Group Head	Senior Researcher	R4	Permanent (ICP)
Dr. Isaac Casanovas-Vilar	'Ramón y Cajal'	Researcher	R3	Tenure-track (GE)
Dr. Marc Furió	Researcher	Researcher	R3	Permanent (ICP)
Dr. Joan Madurell-Malapeira	Researcher	Researcher	R3	Permanent (ICP)
Dr. Antonio Sánchez-Marco*	Researcher	Researcher	R3	Permanent (ICP)
Dr. Josep M. Robles	Postdoc	Postdoctoral Researcher	R2	Fixed-term (ICP)
Dr. Ana Rosa Gómez Cano*	Postdoc	Postdoctoral Researcher	R2	Fixed-term (ICP)
Víctor Vinuesa‡	FI Predoc	Predocctoral Researcher	R1	Fixed-term (AGAUR)
Sharrah McKenzie§	FI Predoc	Predocctoral Researcher	R1	Fixed-term (other)
Sílvia Jovells-Vaqué	FI Predoc	Predocctoral Researcher	R1	Fixed-term (AGAUR)
Guillem Pons-Monjo	Lab Technician	Technician	R1	Fixed-term (PTA)
Dr. Massimo Delfino	Researcher	Research Associate	R3	—
Dr. Chiara Angelone	Researcher	Research Associate	R3	—
Dr. Israel M. Sánchez	Researcher	Research Associate	R3	—
Dr. Juan Abella	Researcher	Research Associate	R3	—
Dr. Jan van Dam	Researcher	Research Associate	R3	—
Dr. Daniel DeMiguel	Researcher	Research Associate	R3	—
Dr. Israel García-Paredes	Researcher	Research Associate	R3	—
Dr. Àngel H. Luján	Postdoc	Research Associate	R2	—
Josep Aurell	Freelance	Research Collaborator	R1	—
Jordi Balaguer	Freelance	Research Collaborator	R1	—
Anneke Madern	Predoc	Research Collaborator	R1	—

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Paleoprimatology & Human Paleontology

From a chronological viewpoint, the scope of the research group in Paleoprimatology & Human Paleontology covers the entire evolutionary history of primates, i.e., the Paleogene (66–23 Ma), the Neogene (23.0–2.6 Ma) and the Quaternary (2.6–0.0 Ma)—even though three main lines of research can be distinguished: one based on the diverse record of Eocene primates from Catalonia; another one based on the exceptional record of Miocene catarrhines, especially apes; and a third one focused on the Plio-Pleistocene record of monkeys and humans. The group studies the paleobiodiversity and phylogenetic relationships of these groups, as well as their paleobiology (diet, locomotion, etc.). Associated faunas are also

investigated to contextualize the primate finds from a paleoenvironmental and chronological viewpoint. Of particular relevance is the research focused on the evolution of hominoids—the group that includes lesser apes, great apes, and humans—with emphasis on the hotly debated phylogenetic and paleobiogeographic hypotheses on the origin and evolution of the great-ape-and-human clade, with further implications for deciphering the origin of gibbons, reconstructing the last common ancestor of apes and humans, and evaluating the importance of homoplasy in hominoid evolution.

RESEARCH GROUP OF PALEOPRIMATOLOGY & HUMAN PALEONTOLOGY				
NAME	POSITION	CATEGORY	PROFILE	TYPE OF CONTRACT
Prof. Salvador Moyà-Solà	Research Group Head	Senior Researcher	R4	Permanent (ICREA)
Dr. Judit Marigó	'Juan de la Cierva'	Postdoctoral Researcher	R2	Fixed-term (GE)
Alessandro Urciuoli	FPI Predoc	Predocctoral Researcher	R1	Fixed-term (GE)
Marta Palmero†	Scientific Illustrator	Technician	R1	Fixed-term (ICP)
Dr. Víctor Fondevilla*	Lab Technician	Technician	R1	Fixed-term (ICP)
Prof. Eric Delson	Senior Researcher	Research Associate	R4	—
Dr. Tomàs Marquès-Bonet§	Senior Researcher	Research Associate	R4	—
Dr. Sergio Almécija	Senior Researcher	Research Associate	R4	—
Dr. Raef Minwer-Barakat	Researcher	Research Associate	R3	—
Dr. Marta Pina	Postdoc	Research Associate	R2	—
Dr. Arnau Bolet	Postdoc	Research Associate	R2	—
Ivette Susanna	Predoc	Research Collaborator	R1	—
Joan Femenias-Gual	Predoc	Research Collaborator	R1	—

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Evolutionary Paleobiology

The research group of Evolutionary Biology is not restricted to a particular time span, but rather focused on a single—but most important—topic, namely, the evolution of mammalian life-histories under changing ecological conditions. The group takes advantage of the unique deep-time perspective that only paleontology can provide to test hypotheses on the evolution of life-history strategies from the viewpoint of adaptation. To do so, this group takes a methodological approach that mostly relies on the paleohistological study of hard tissues (bone and teeth) of extinct mammals within the analytical framework provided by life history theory of biological evolution—which combines ecology, demography, physiology and adaptation, and further has significant implications for conservation biology (extinction) as well as evolutionary developmental biology (aging). By means of the study of skeletochronological markers and body mass estimation, the group can reconstruct the growth and developmental trajectories of extinct mammals and test the correlation of key life-history traits with environmental indicators, in order to test the evolutionary hypotheses of interest. Particularly relevant for this group is the study of the differential responses provided by large and small mammals to the peculiar ecological conditions provided by insular ecosystems, with

emphasis on the study of extinct mammals from the fossil Mediterranean islands of the Miocene.

RESEARCH GROUP OF EVOLUTIONARY PALEOBIOLOGY				
NAME	POSITION	CATEGORY	PROFILE	TYPE OF CONTRACT
Prof. Meike Köhler	Research Group Head	Senior Researcher	R4	Permanent (ICREA)
Dr. Josep Quintana*	Researcher	Researcher	R3	Permanent (ICP)
Dr. Blanca Moncunill-Solé*†	Postdoc	Postdoctoral Researcher	R2	Permanent (ICP)
Dr. Carmen Nacarino‡	Postdoc	Research Associate	R2	—
Guillem Orlandi	FI Predoc	Predocctoral Researcher	R1	Fixed-term (AGAUR)
Teresa Calderón	FPI Predoc	Predocctoral Researcher	R1	Fixed-term (GE)
Manuel Fernández	Lab Technician	Technician	R1	Permanent (ICP)

Abbreviations: * = Part-time; § = The relationship with the ICP started or was resumed in 2018; † = The relationship with the ICP ended in 2018; ‡ = The relationship with the ICP changed in 2018 (e.g., from contract to research associate/collaborator).

Research associates

Research associates are researchers that lack an employment relationship with the ICP but nevertheless actively contribute to the research performed at our institution. The terms of this collaboration (including the ICP and the researcher's commitments) are stipulated on a written agreement that further stipulates the scope of the collaboration and can be more or less personalized depending on the strategic significance of the collaboration.

RESEARCH ASSOCIATES (2018)					
NAME	PRIMARY AFFILIATION	POSITION	R.G./AREA	START DATE	
Dr. Sergio Almécija	American Museum of Natural History, New York, USA	Senior Researcher (R4)	PHP	20/10/2017	
Prof. Eric Delson	Lehman College, City University of New York, USA	Senior Researcher (R4)	PHP	24/10/2017	
Dr. Tomàs Marquès-Bonet	ICREA-Universitat Pompeu Fabra, Barcelona, Spain	Senior Researcher (R4)	PHP	28/09/2018	
Dr. Massimo Delfino	Università degli Studi di Torino, Turin, Italy	Researcher (R3)	NQF	01/01/2011	
Dr. Chiara Angelone	Università di Roma Tre, Rome, Italy	Researcher (R3)	NQF	01/01/2012	
Dr. Fabio M. Dalla Vecchia	Museo Friulano di Storia Naturale, Udine, Italy	Researcher (R3)	MF	15/07/2013	
Dr. Israel M. Sánchez	ICP (independent researcher)	Researcher (R3)	NQF	01/06/2016	
Dr. Jan van Dam	Utrecht University, The Netherlands	Researcher (R3)	NQF	01/11/2016	
Dr. Juan Abella	Universidad Estatal Península de Santa Elena, Ecuador	Researcher (R3)	NQF	13/10/2017	
Dr. Daniel DeMiguel	ARAID-Universidad de Zaragoza, Spain	Researcher (R3)	NQF	01/11/2017	
Dr. Nicolas Malchus	ICP (independent researcher)	Researcher (R3)	MF	01/11/2017	
Dr. Raef Minwer-Barakat	Universidad de Granada, Spain	Researcher (R3)	PHP	01/12/2017	
Dr. Israel García-Paredes	Universidad Complutense de Madrid, Spain	Researcher (R3)	NQF	12/01/2018	
Dr. Arnau Bolet	School of Earth Sciences, Bristol University, UK	Postdoc (R2)	PHP, NQF, MF	20/09/2013	
Dr. Marta Pina	Kyoto University, Japan	Postdoc (R2)	PHP	01/11/2016	
Dr. Víctor Fondevilla	Universitat Autònoma de Barcelona, Spain	Postdoc (R2)	MF, EP	03/03/2017	
Dr. Ángel H. Luján	Masaryk University, Czech Republic	Postdoc (R2)	NQF	01/11/2017	
Dr. Jordi Marcé-Nogué	Centre of Natural History, Universität Hamburg, Germany	Postdoc (R2)	VP	19/12/2017	
Dr. Eudald Mujal	ICP (independent researcher)	Postdoc (R2)	VP	10/01/2018	
Dr. Soledad De Esteban-Trivigno	Transmitting Science, Piera, Spain	Postdoc (R2)	VP	01/06/2018	
Dr. Carmen Nacarino	ICP (independent researcher)	Postdoc (R2)	EP	01/10/2018	

At the end of 2018 the ICP had 21 research associates, of which 17 with a different primary affiliation (6 in Spain, 3 in Italy, 2 in the UEA, 1 in The Netherlands, 1 in Ecuador, 1 in Japan, 1 in UK, and 1 in the Czech Republic).

Current research associates. A complete list of current research associates is provided above. Note that the status of research associate is restricted to R2-R4 researchers (i.e., PhD). PhD students and other people that actively collaborate with ICP research but lack an employment relationship with the institution may be considered ‘collaborators’, a figure that does not require a written agreement but further implies signing research outputs with ICP affiliation. Note that many agreements are dated to 2017; in most instances this is merely the date in which previous verbal agreements were formalized.

New research line. One of the most promising research areas thus far underexplored at the ICP is that of paleogenetics and paleoproteomics, in the framework of phylogenetics (i.e., the reconstruction of the evolutionary relationships between living organisms, either extant or extinct). During the last decade, the possibility to extract and sequence mitochondrial and nuclear DNA from ancient organisms from several hundred thousands years ago has prompted a revolution in vertebrate phylogenetics in general, and in human evolutionary studies in particular. Although such studies are limited further back in time, paleoproteomics (the recovery and sequencing of structural proteins, such as collagen, preserved in fossil remains from millions of years ago) offers even more revolutionary prospects for phylogenetic reconstruction based on extinct organisms in decades to come.

In agreement with the ICP vision and scientific policy, the ICP aims to progressively implement a new line of research of paleogenetics and paleoproteomics. Initially, this line will be devoted to the study of primate and human evolution within the Paleoprimatology & Human Paleontology Research Group. However, if successful enough it could be further extended progressively to other vertebrate groups, eventually leading to the creation of a new Paleogenetics & Paleoproteomics Research Group at the ICP.

With these aims in mind, research collaboration agreement with ICREA Research Professor Tomàs Marquès-Bonet (Institut de Biologia Evolutiva, CSIC-Universitat Pompeu Fabra) was signed in September 2018. By virtue of this agreement, Dr. Marquès-Bonet has become research associate of the ICP and beginning in 2019 the center will provide him some funds to initiate the above-mentioned research line. This will represent a most significant broadening of the scientific focus of the ICP in years to come, although it needs to be remarked that such an approach is fully compatible (and complementary) with the various research lines already pursued at the ICP. Such strategic move, which is totally coherent with the ICP vision that paleobiology is deeply entrenched among the life sciences (and particularly evolutionary biology), is considered of utmost significance to further promote the ICP as one of the leading and benchmark centers of vertebrate and human paleobiology at an international level, because it offers the promise to boost the visibility, impact and competitiveness of the ICP much beyond their current levels. Among other actions, the ICP aims to participate in a European Training Network application focused on primate and human paleoproteomics early in 2019.

TECHNICAL DEPARTMENTS

Three departments to make the institute and museum work

Departmental organization

The ICP has three technical departments (Outreach & Communication, Management & Human Resources, and Research Support & External Services), each one directed by a Head of Department. They are supervised by and formally depend upon the General Manager. However, the Steering Committee (which includes the Director and the three Heads of Department) further contributes significantly to the coordination among these departments as well as between them and the various research groups. Each department includes several areas, which may have a Head of Area when an intermediate hierarchical level is required to coordinate the personnel included within.

- Outreach & Communication Dept.: Pere Figuerola (Head of Dept.).
 - ✓ Communication and Scientific Dissemination: Pere Figuerola (Head of Area).
 - ✓ Museum Area: Teresa Esquirol (Head of Area).
 - ✓ Archive & Documentation Area: Teresa Requena (Archivist & Documentalist).

- Management & Human Resources: Enric Menéndez (Head of Dept.).
 - ✓ Maintenance Area: Manel Llenas (Maintenance Technician).
 - ✓ Administration Area: Maria Pérez (Administrative Officer).

- Research Support & External Services: Dr. Josep Fortuny (Head of Dept.).
 - ✓ Fieldwork & Collections Management Area: Jordi Galindo (Head of Area).
 - ✓ Preparation & Conservation Area: Xènia Aymerich (Head of Area).
 - ✓ Virtual Paleontology Area: Dr. Josep Fortuny (Head of Area).
 - ✓ Projects Area: Laila Pilgren (Project Manager).
 - ✓ Information Technology Area: Josep Torres (IT External Consultant).

Outreach & Communication

This department has the aim to improve internal communication as well as to better coordinate external communication, scientific dissemination and outreach activities. It includes the following areas:

- Communication & Scientific Dissemination.
- Museum.
- Archive & Documentation Area.

DEPARTMENT OF OUTREACH & COMMUNICATION			
NAME	POSITION	AREA	TYPE OF CONTRACT
Pere Figuerola	Head of Dept. & Area	Communication & Scientific Dissemination	Permanent (ICP)
Teresa Esquirol	Head of Area	Museum	Civil Servant (GC)
Mònica Cucurella*	Receptionist	Museum	Permanent (ICP)
María Pereira*	Receptionist	Museum	Permanent (ICP)
Mònica Ferré	Receptionist (Dinosfera)	Museum	Fixed-term (ICP)
Pilar Algerich	Receptionist (Dinosfera)	Museum	Fixed-term (ICP)
Teresa Requena	Archivist & Documentalist	Archive & Documentation Area	Civil Servant (GC)

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Management & Human Resources

This department has the aim to improve and give visibility to our human resources policies within the context of the implementation of HRS4R. It includes the following areas:

- Maintenance.
- Administration.

DEPARTMENT OF MANAGEMENT & HUMAN RESOURCES			
NAME	POSITION	AREA	TYPE OF CONTRACT
Enric Menéndez	Head of Dept.	—	Permanent (ICP)
Manel Llenas	Maintenance Technician	Maintenance	Civil Servant (GC)
María Pérez	Administrative Officer	Administration	Permanent (ICP)

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Research Support & External Services

This department has the aim to boost remunerated external services provided to third parties, as well as to improve the coordination between the various areas involved in research support. It includes the following areas:

- Fieldwork & Collections Management.
- Preparation & Conservation.
- Virtual Paleontology.
- Projects.
- Information Technology.

DEPARTMENT OF RESEARCH SUPPORT & EXTERNAL SERVICES			
NAME	POSITION	AREA	TYPE OF CONTRACT
Dr. Josep Fortuny	Head of Dept. & Area	Virtual Paleontology	Permanent (ICP)
Jordi Galindo	Head of Area	Fieldwork & Collections Mgmt.	Permanent (ICP)
Dr. Josep M. Robles	Fieldwork Officer & Collection Manager	Fieldwork & Collections Mgmt.	Fixed-term (ICP)
Manel Llenas	Field Technician	Fieldwork & Collections Mgmt.	Civil Servant (GC)
Dr. Víctor Vinuesa*	Field Technician	Fieldwork & Collections Mgmt.	Fixed-term (ICP)
Mario Salerno§†	Field Technician	Fieldwork & Collections Mgmt.	Fixed-term (ICP)
Manel Méndez	Field Assistant	Fieldwork & Collections Mgmt.	Permanent (ICP)
Xènia Aymerich	Head of Area	Preparation & Conservation	Fixed-term (PTA)
Marta Valls	Preparation Technician	Preparation & Conservation	Permanent (ICP)
Núria Guerrero	Preparation Technician	Preparation & Conservation	Permanent (ICP)
Marina Rull	Preparation Technician	Preparation & Conservation	Fixed-term (PTA)
Júlia Jiskoot†	Preparator Technician	Preparation & Conservation	Fixed-term (ICP)
Rosendo Vall i Castelló§†	Preparator Technician	Preparation & Conservation	Fixed-term (ICP)
Marta S. March†	Collection Manager	Fieldwork & Collections Mgmt.	Permanent (ICP)
Sergio Llácer*	Lab Technician	Virtual Paleontology	Permanent (ICP)
Dr. Soledad De Esteban-Trivigno*‡	Research Associate (R2)	Virtual Paleontology	—
Dr. Jordi Marcé-Nogué	Research Associate (R2)	Virtual Paleontology	—
Dr. Eudald Mujal	Research Associate (R2)	Virtual Paleontology	—
Laila Pilgren	Project Manager	Projects Area	Permanent (ICP)
Josep Torres*	IT External Consultant	Information Technology	—

Abbreviations: * = Part-time; § = The relationship with the ICP started or was resumed in 2018; † = The relationship with the ICP ended in 2018; ‡ = The relationship with the ICP changed in 2018.

PART 2

ICP ACTIVITIES 2018

In 2018, the ICP has demonstrated again excellent levels of scientific production and productivity, while persisting in the recovery, conservation and dissemination of the paleontological heritage from Catalonia. Outreach and communication activities have pivoted around the ICP webpage and Museum; fundraising has emphasized the provision of fieldwork services; and managerial activities have consisted in implementing human resources policies for researchers and the new Strategic Plan for 2018-2021.

RESEARCH OUTPUTS

High productivity and quality in scientific publications

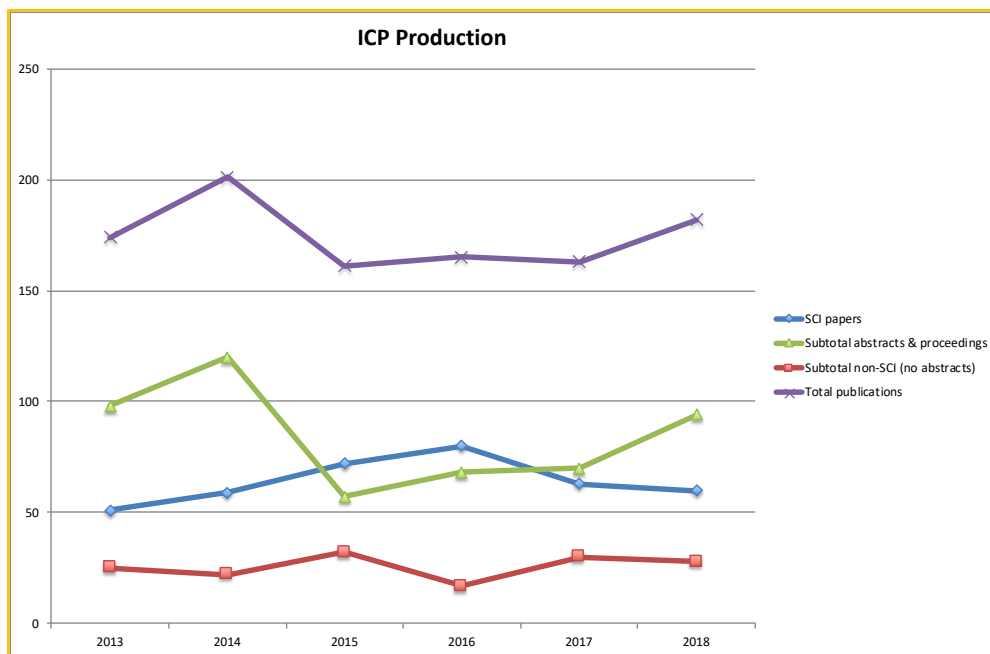
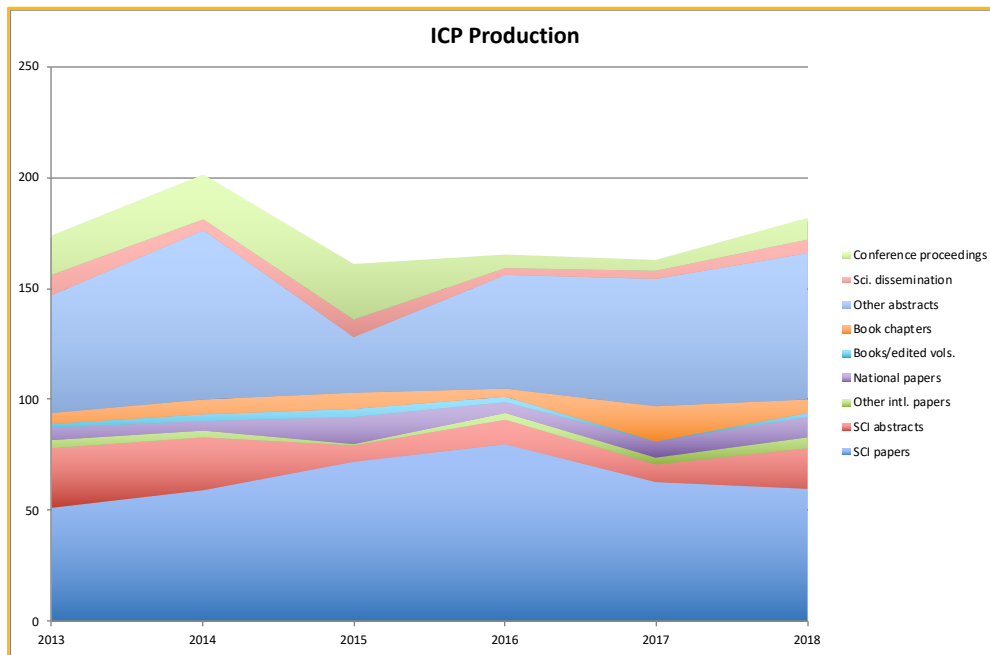
Publications

The publications of the ICP in 2018 are reported in the Appendix at the end of this document, being divided into the following categories (SCI refers to journals from the Science Citation Index, i.e., indexed by the Journal Citation Reports, JCR):

- SCI papers.
- SCI abstracts.
- Papers in other international journals.
- Papers in national journals.
- Books and edited volumes.
- Book chapters.
- Conference proceedings.
- Other abstracts.
- Scientific dissemination papers.

ICP PUBLICATIONS (2013–2017 vs. 2018)							
PUBLICATION CATEGORIES	2013	2014	2015	2016	2017	AVERAGE	2018
SCI papers	51	59	72	80	63	65.0	60
SCI abstracts	27	24	7	11	8	15.4	18
Papers in other international journals	4	3	1	3	3	2.8	5
Papers in national journals	5	4	12	5	7	6.6	9
Books and edited volumes	2	3	4	2	0	2.2	2
Book chapters	5	7	7	4	16	7.8	6
Conference proceedings	18	20	25	6	5	14.8	10
Other abstracts	53	76	25	51	57	52.4	66
Scientific dissemination papers	9	5	8	3	4	5.8	6
TOTAL	174	201	161	165	163	172.8	182

The numbers of total publications (182) and in particular SCI papers (60) for 2018 are slightly below the average values for 2013–2017 (173 and 65, respectively) and overall quite similar for the same values in 2017 (163 and 63, respectively). When publications are grouped into three main categories (SCI papers, non-SCI papers, and abstracts/conference proceedings), it can be seen that with some fluctuations they are all quite stable, except for a peak in contribution meetings in 2014.



Contributions to meetings

The number of published abstracts and conference proceedings (see above) is a good proxy for contributions to meetings (although there can be some delay in the publication of conference proceedings). The number of abstracts/conference proceedings published in 2018 is slightly above the average for the five preceding years, although still below the 2013-2014 levels.

In particular, in 2018 ICP authors coauthored up to 92 contributions to a total of 18 meetings, of which 82 (89%) in 16 international meetings. Most outstanding is the presence of the ICP at the annual meetings of the European Association of Vertebrate Palaeontologists and

the American Association of Physical Anthropologists, with 30 and 12 communications, respectively.

MEETING	CITY (COUNTRY)	COMMS.
XVI Annual Meeting of the European Association of Vertebrate Palaeontologists	Caparica (Portugal)	30
87th Annual Meeting of the American Association of Physical Anthropologists	Austin (USA)	12
8th Annual Meeting of the European Society for the Study of Human Evolution	Faro (Portugal)	4
5 th International Palaeontological Congress	Paris (France)	7
78th Annual Meeting Society of Vertebrate Paleontology	Albuquerque (USA)	6
6th International Symposium on Pterosaurs	Los Angeles (USA)	5
II Joint Congress of Evolutionary Biology	Montpellier (France)	4
Regional Committee on Mediterranean Neogene Stratigraphy workshop & NOW meeting	Bratislava (Slovakia)	3
Giornate de Paleontologia 2018	Trento e Pedrazzo (Italy)	3
First Italian Meeting of Young Researchers	Florence (Italy)	2
72 nd Annual Meeting Anthropological Association of Nippon	Mishima (Japan)	1
62 nd Annual Meeting The Palaeontological Association	Bristol (UK)	1
5th Joint International Conference on Multibody System Dynamics	Lisbon (Portugal)	1
XVIII ^e Congrès Union Internationale des Sciences Préhistoriques et Protohistoriques	Paris (France)	1
XXXIXe Rencontres Internationales d'Archéologie et d'Histoire d'Antibes	Antibes (France)	1
9 th BWG Meeting. The Archaeology of Human-Bird Interactions	Sheffield (UK)	1
Ist Palaeontological Virtual Congress	(virtual meeting organized in Spain)	7
XVI Meeting of Young Researchers in Paleontology	Gasteiz (Spain)	3

Scientific production, productivity, and impact

Methods. Whereas ‘production’ refers to the number of scientific outputs published in 2018, ‘productivity’ refers to the ratio between production and the total number of authors that have coauthored these publications with ICP affiliation. To compare the production, productivity, and quality/impact of ICP research outputs in 2018 with that of the five previous years, this report focuses on SCI ‘papers’, which include all publications (articles, technical notes, etc.) except abstracts in journals indexed by the JCR. Bibliometric indicators for these journals have been taken from the JCR of the year of definitive publication, except for 2018, which were taken from 2017 (since the 2018 edition of JCR has not been published yet). The following aspects and metrics were considered for each journal:

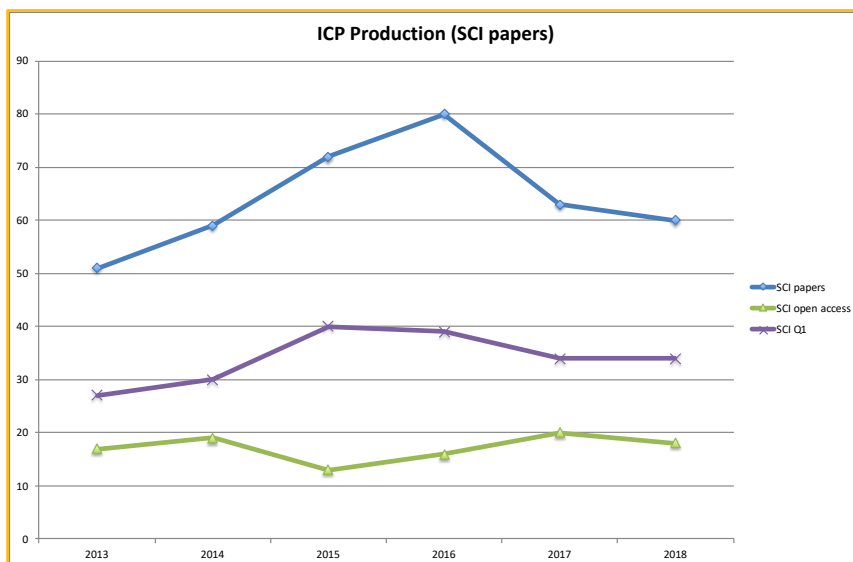
- Journal category (if several, the most favorable with respect to journal ranking).
- Journal impact factor (IF).
- Journal quartile (Q1 = first quartile, Q2 = second quartile, etc.).
- Journal impact factor percentile (JIF%).
- Open access (excluding green open access).

The following metrics of production, productivity and impact were computed for 2018:

- SCI = total number of SCI papers (excluding abstracts) coauthored by ICP authors.
- SCI productivity = SCI / number of ICP authors (those with ICP affiliation in SCI papers).
- Q1 = total number of Q1 papers coauthored by ICP authors.
- OA = total number of open access SCI papers coauthored by ICP authors.
- Q1 productivity = Q1 / number of ICP authors.
- Q1 ratio = Q1 / Production x 100 (in %).
- OA ratio = OA / Production x 100 (in %).
- Median JIF%.
- IF geometric mean (IFGM).

Production. The production of the ICP in terms of total SCI papers during 2018 is slightly below the average value for the preceding five years, although it is most similar to figures from 2014 and 2017. The production in terms of first quartile SCI papers, in turn, is virtually identical to the value for 2017 as well as to the average for the previous five years. Finally, open access production in 2018 is only slightly lower than in 2017 and slightly higher than the average for the last five years.

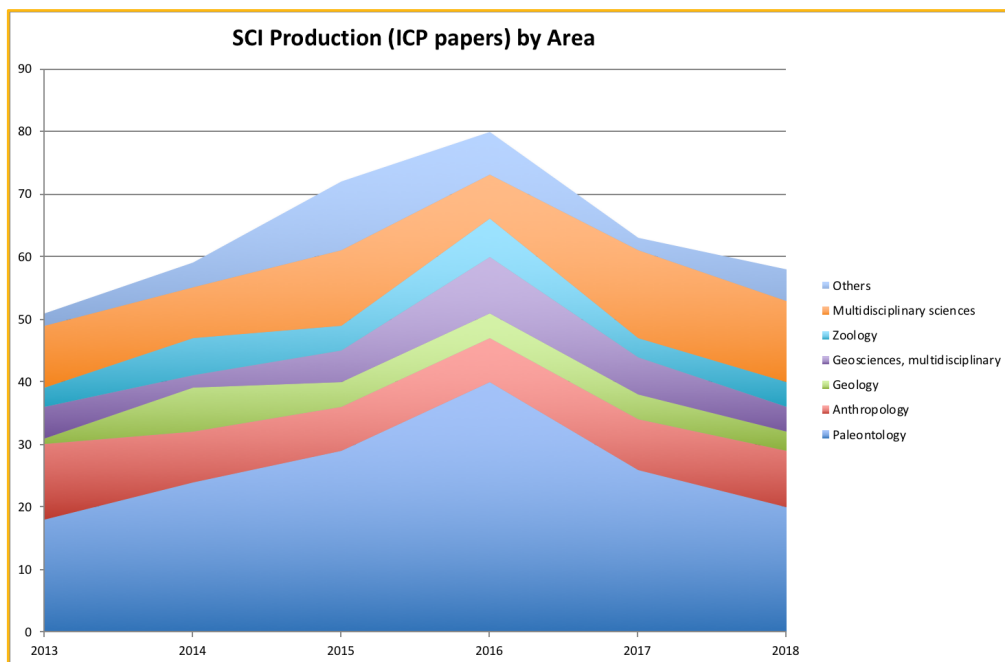
SCI PRODUCTION (2013–2017 vs. 2018)							
METRICS	2013	2014	2015	2016	2017	AVERAGE	2018
SCI	51	59	72	80	63	65.0	60
Q1	27	30	40	39	34	34.0	34
OA	17	19	13	16	20	17.0	18



If SCI production is broken down by research areas of the JCR, it can be seen that a large proportion of ICP production corresponds to journals from the area of Paleontology (ca. 40%), followed by Multidisciplinary sciences, Anthropology, Geosciences multidisciplinary, Zoology, and Geology. The percentages for each category in 2018 are generally similar to the

corresponding averages for the preceding five years, except for the category of Multidisciplinary sciences, which is still well above the average values for the preceding five years.

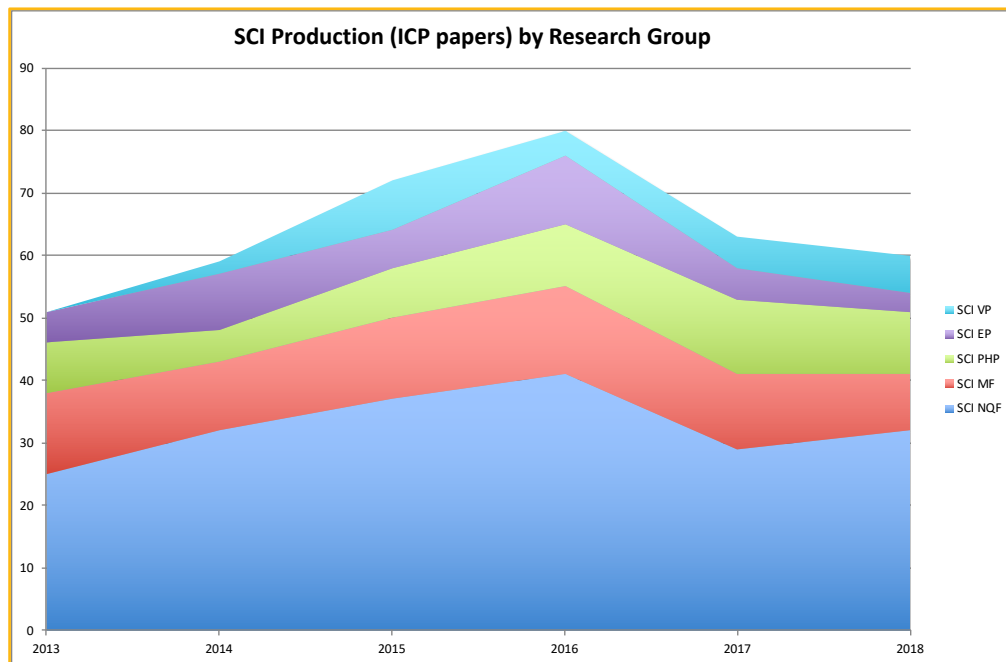
SCI PRODUCTION BY AREAS (2013–2017 vs. 2018)							
JCR AREAS	2013	2014	2015	2016	2017	AVERAGE	2018
Paleontology	18	24	29	40	26	27.4	20
Anthropology	12	8	7	7	8	8.4	9
Geology	1	7	4	4	4	4.0	3
Geosciences, multidisciplinary	5	2	5	9	6	5.4	4
Zoology	3	6	4	6	3	4.4	4
Multidisciplinary sciences	10	8	12	7	14	10.2	13
Others	2	4	11	7	2	5.2	5
%Paleontology	35.3	40.7	40.3	50.0	41.3	42.2	33.3
%Anthropology	23.5	13.6	9.7	8.8	12.7	12.9	15.0
%Geology	2.0	11.9	5.6	5.0	6.3	6.2	5.0
%Geosciences, multidisciplinary	9.8	3.4	6.9	11.3	9.5	8.3	6.7
%Zoology	5.9	10.2	5.6	7.5	4.8	6.8	6.7
%Multidisciplinary sciences	16.9	13.6	16.7	8.8	22.2	15.7	21.7
%Others	3.9	6.8	15.3	8.8	3.2	8.0	8.3



By research group (including the four current research groups, as well as the former group of Virtual Paleontology, currently a semitechnical area), the percentages for 2018 are rather similar to the corresponding average values for the preceding five years, indicating that more than half of the ICP production is performed by the Neogene & Quaternary Faunas (NQF) group, followed by the research groups of Paleoprimatology & Human Paleontology (PHP) and Mesozoic Faunas (MF), and then Virtual Paleontology (VP) and Evolutionary Paleobiology (EP).

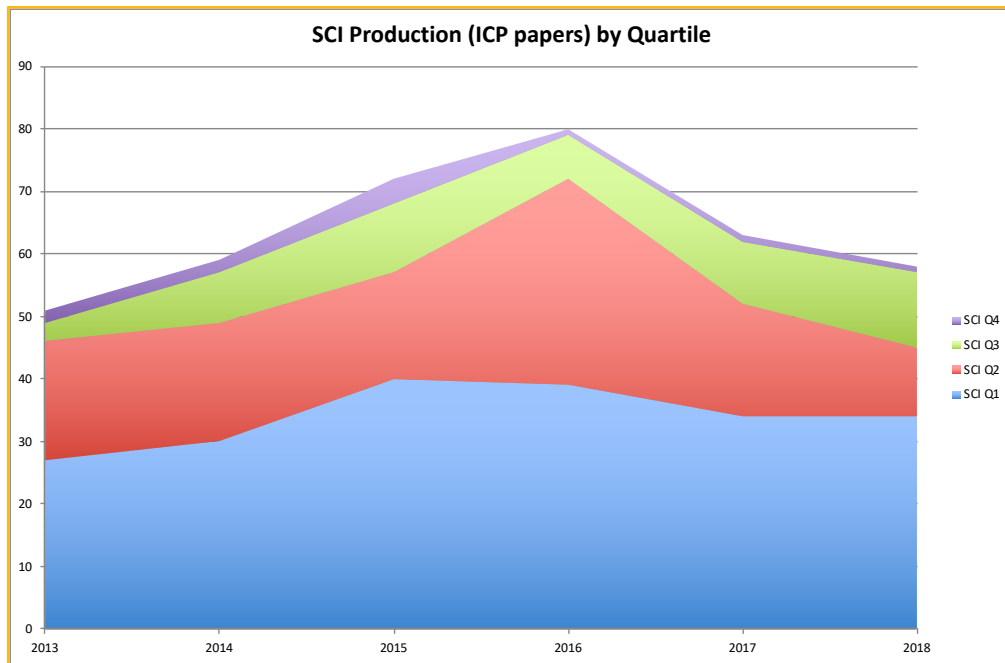
Only the figures of VP and EP appear remarkable by being respectively higher and lower than average during the last five years, although they are both still relatively meager as compared to the other groups (and especially NQF).

SCI PRODUCTION BY RESEARCH GROUPS (2013–2017 vs. 2018)							
RESEARCH GROUP	2013	2014	2015	2016	2017	AVERAGE	2018
SCI MF	13	11	13	14	12	12.6	9
SCI NQF	25	32	37	41	29	32.8	32
SCI PHP	8	5	8	10	12	8.6	10
SCI EP	5	9	6	11	5	7.2	3
SCI VP	0	2	8	4	5	3.8	6
SCI MF %	25.5	18.6	18.1	17.5	19.0	19.4	15.0
SCI NQF %	49.0	54.2	51.4	51.3	46.0	50.5	53.3
SCI PHP %	15.7	8.5	11.1	12.5	19.0	13.2	16.7
SCI EP %	9.8	15.3	8.3	13.8	7.9	11.1	5.0
SCI VP %	0.0	3.4	11.1	5.0	7.9	5.8	10.0



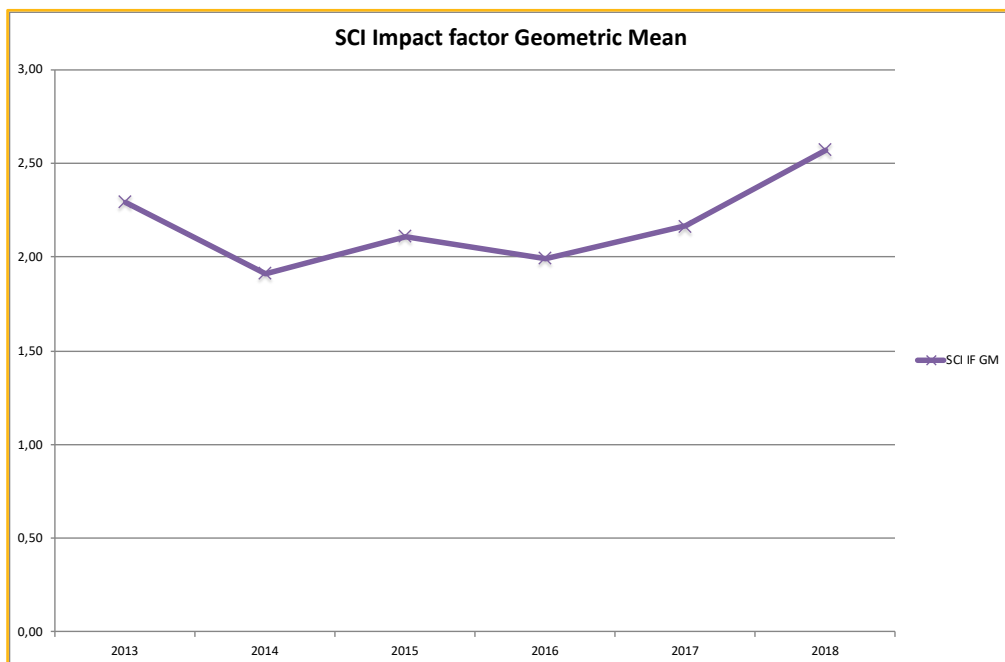
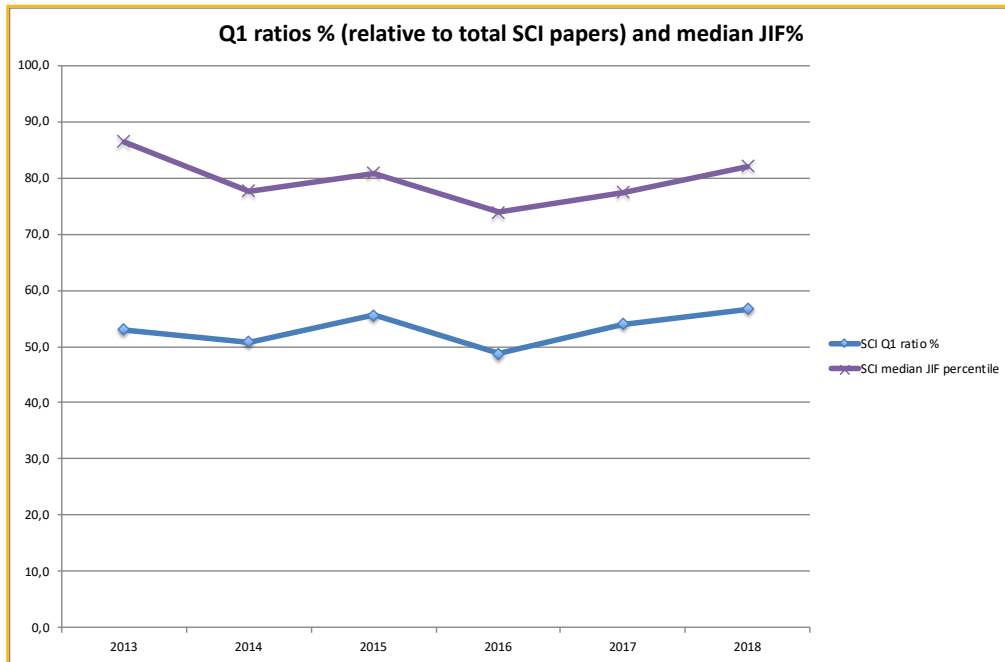
Quality and impact. If production is broken down by quartiles, it becomes obvious that most of ICP production in SCI journals is concentrated on the Q1 and, to a lesser extent, the Q2, whereas articles published in Q3 and Q4 journals are a minority. In 2018 the number of papers published in Q2 and Q3 is more similar than in preceding years, but interestingly the papers published in Q1 are more than half the total SCI production.

SCI PRODUCTION BY QUARTILES (2013–2017 vs. 2018)							
QUARTILE	2013	2014	2015	2016	2017	AVERAGE	2018
Q1	27	30	40	39	34	34.0	34
Q2	19	19	17	33	18	21.2	11
Q3	3	8	11	7	10	7.8	12
Q4	2	2	4	1	1	2.0	1



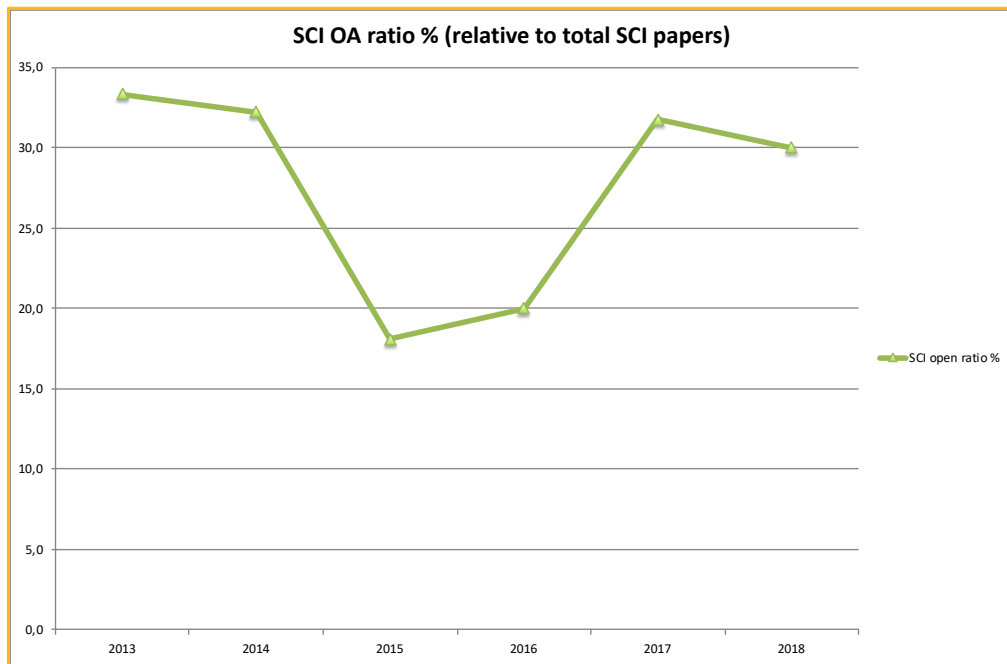
The Q1 ratio for 2018 is slightly above the average for the preceding five years, and both figures are above 50%. It can be concluded that, with slightly fluctuations, during the last years slightly more than half the SCI production of the ICP has been performed in the top 25% journals of the various JCR categories. This is further confirmed by the median JIF percentile for the preceding five years (77.6), a metric that except for minor oscillations generally stays above the 75th percentile (i.e., within the top 25% journals). The impact factor geometric mean shows wider fluctuations around 2.0, with the figure for 2018 (2.6) being higher than that for any of the preceding five years.

SCI PRODUCTION IMPACT & QUALITY (2013–2017 vs. 2018)							
METRICS	2013	2014	2015	2016	2017	AVERAGE	2018
Q1 ratio	52.9	50.8	55.6	48.8	52.3	51.1	56.7
Median JIF%	86.4	77.6	80.8	73.8	77.3	77.6	82.0
IFGM	2.29	1.91	2.11	1.99	2.17	2.08	2.57

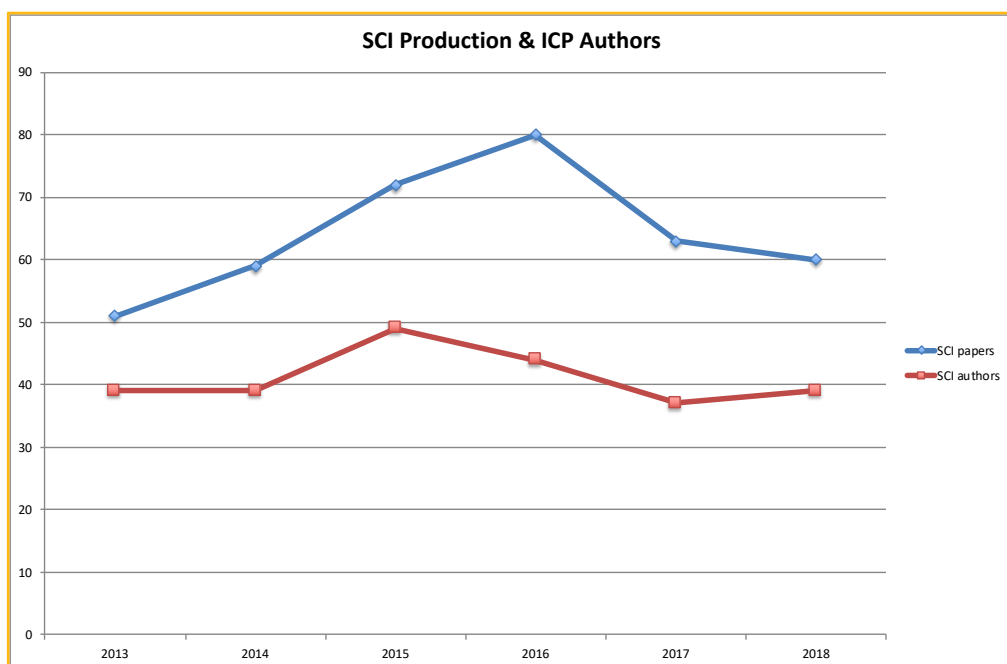


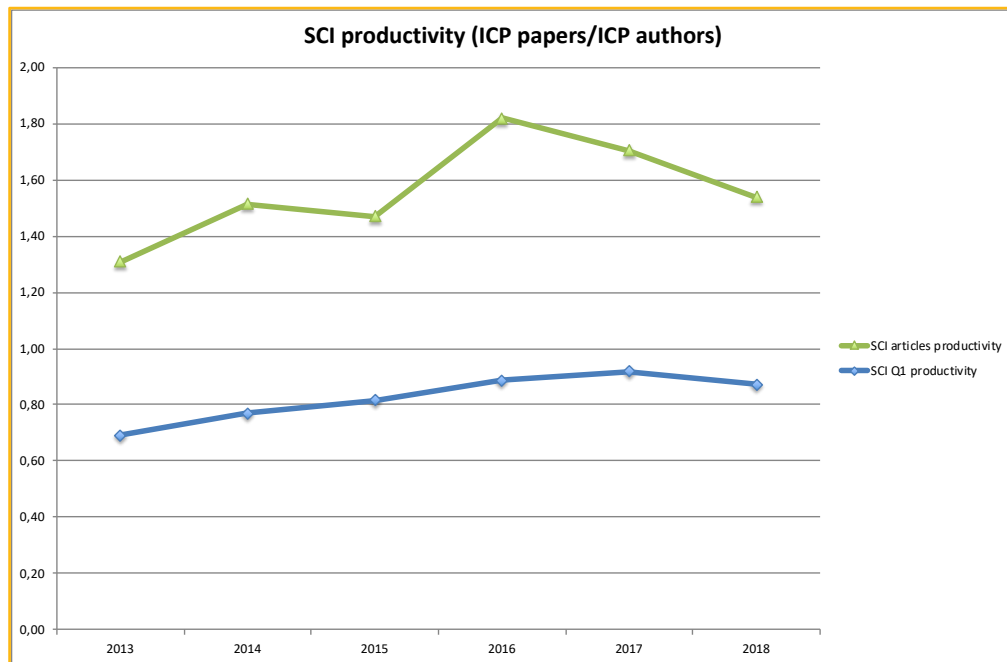
With regard to the open access ratio, current values are slightly above the average for the five preceding years, being closer to one-third as in most recent years except 2015 and 2016, where it was exceedingly low (coinciding with a production peak).

OPEN ACCESS (2013–2017 vs. 2018)							
METRICS	2013	2014	2015	2016	2017	AVERAGE	2018
OA ratio	33.3	32.2	18.1	20.0	31.8	26.2	30.0



Productivity. The number of ICP authors (including researchers, research associates, collaborators, etc.) is lower than that of SCI papers published each year. The figure for 2018 (39) is slightly lower than the average for the preceding five years, which explains somewhat smaller total in SCI production. Indeed, SCI productivity (production/authors) is similar in 2018 to the average for the preceding five years, although sensibly lower than in 2016 and 2017. The results for Q1 productivity are similar, even though 2018 values are still higher than the average (albeit slightly lower than figures for 2016 and 2017).





SCI PRODUCTIVITY (2013–2017 vs. 2018)							
METRICS	2013	2014	2015	2016	2017	AVERAGE	2018
ICP authors	39	39	49	44	37	41.6	39
SCI productivity	1.31	1.51	1.47	1.82	1.70	1.56	1.54
Q1 productivity	0.69	0.77	0.82	0.89	0.92	0.82	0.87

Leadership, collaborations, and internationalization

Methods. To measure leadership in publication, this report focuses on corresponding authors with ICP affiliation in SCI papers. The following metrics were computed:

- SCI leadership = total number of SCI papers with ICP corresponding author.
- Q1 leadership = total number of Q1 papers with ICP corresponding author.
- SCI leadership ratio = SCI leadership / SCI x 100 (in %).
- Q1 leadership ratio = Q1 leadership / SCI x 100 (in %).

In turn, to measure collaborations (with emphasis on international ones), as a first approximation SCI papers are divided into three categories based on the affiliations of the coauthors from other institutions (i.e., excluding other affiliations of ICP researchers or research associates with more than a single affiliation):

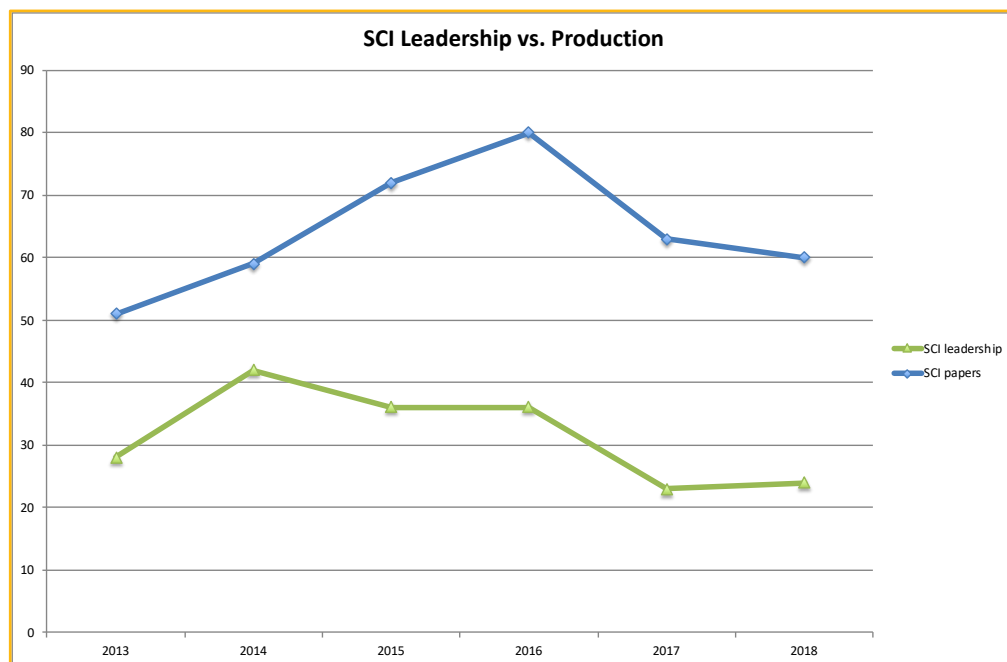
- ICP only: without other affiliations.
- Non-international collaborations: with other national affiliations.
- International collaborations: with foreign affiliations (irrespective of whether there are also other national affiliations or not).

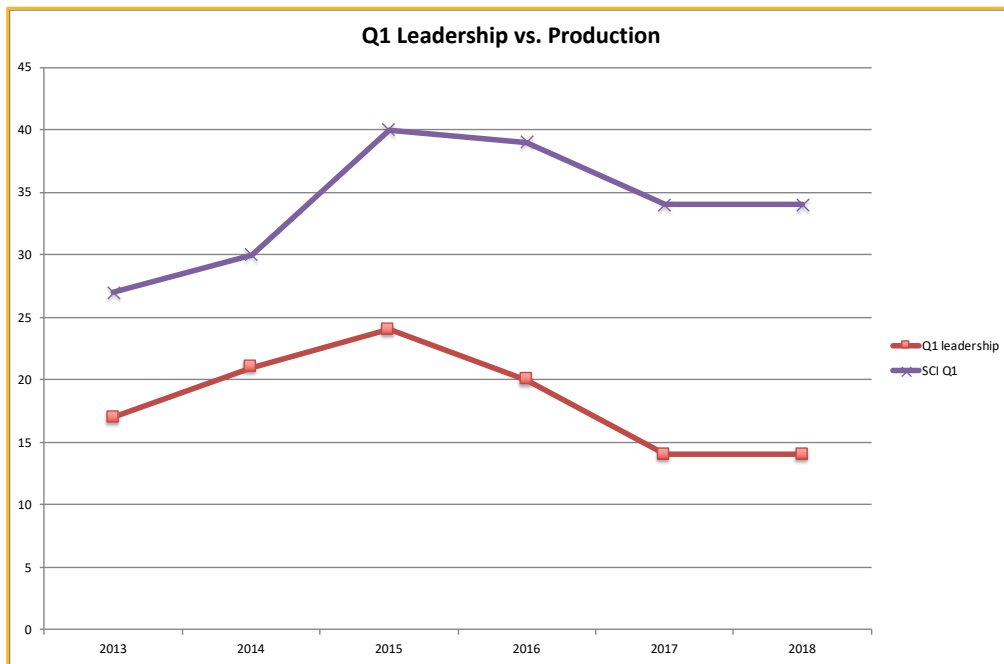
As a second, more refined approximation to collaborations, two different metrics are computed:

- Collaborations-1: number of non-ICP affiliations in SCI papers coauthored by ICP researchers, counting them repeatedly if present in different papers, but irrespective of the number of authors with such affiliations in each paper and excluding those from ICP research associates.
- Collaborations-2: number of non-ICP affiliations in SCI papers coauthored by ICP researchers in a given year, without counting them repeatedly if present in different papers, irrespective of the number of authors with such affiliations and excluding those from ICP research associates.

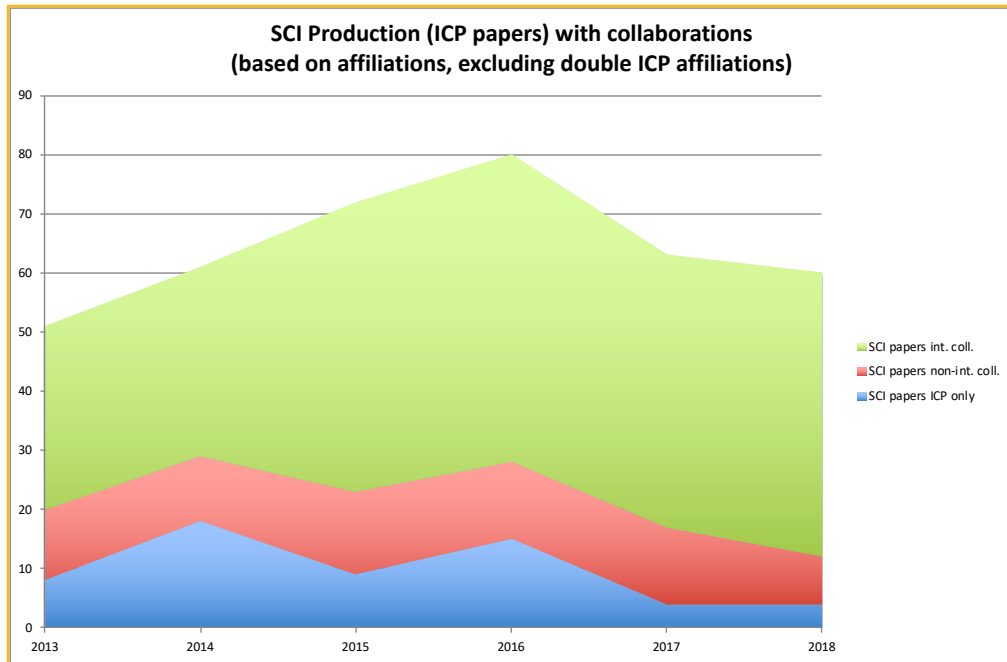
Leadership. Values of leadership for 2018 are lower than the average for the five preceding years. This holds for both total SCI and Q1 leadership, irrespective of whether absolute or relative values are considered, although it is remarkable that the figures for 2018 are comparable or even slightly better than those for 2017. To a large extent, the leadership curves in absolute terms mimic those of production (particularly for Q1), although with a progressive separation between them, leading to a progressive decrease in leadership percentages until 2017, since this trend has been stopped (although not yet reverted) in 2018.

SCI LEADERSHIP (2013–2017 vs. 2018)							
LEADERSHIP	2013	2014	2015	2016	2017	AVERAGE	2018
SCI leadership	28	42	36	36	23	33.0	24
Q1 leadership	17	21	24	20	14	19.2	14
SCI leadership ratio (%)	54.9	71.2	50.0	45.0	36.5	50.8	40.0
Q1 leadership ratio (%)	63.0	70.0	60.0	51.3	41.2	56.5	41.2

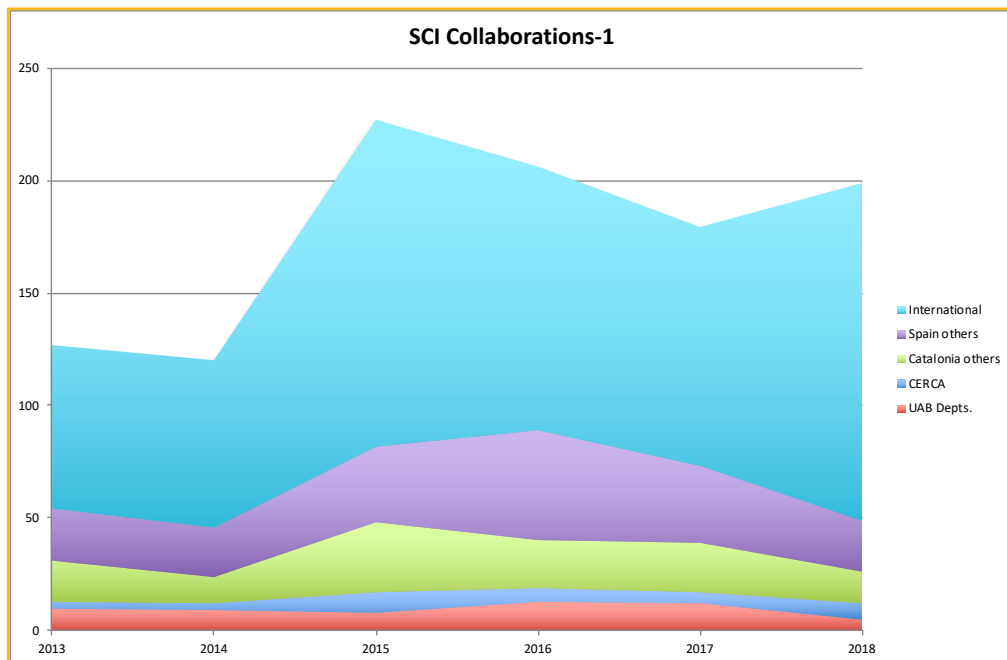


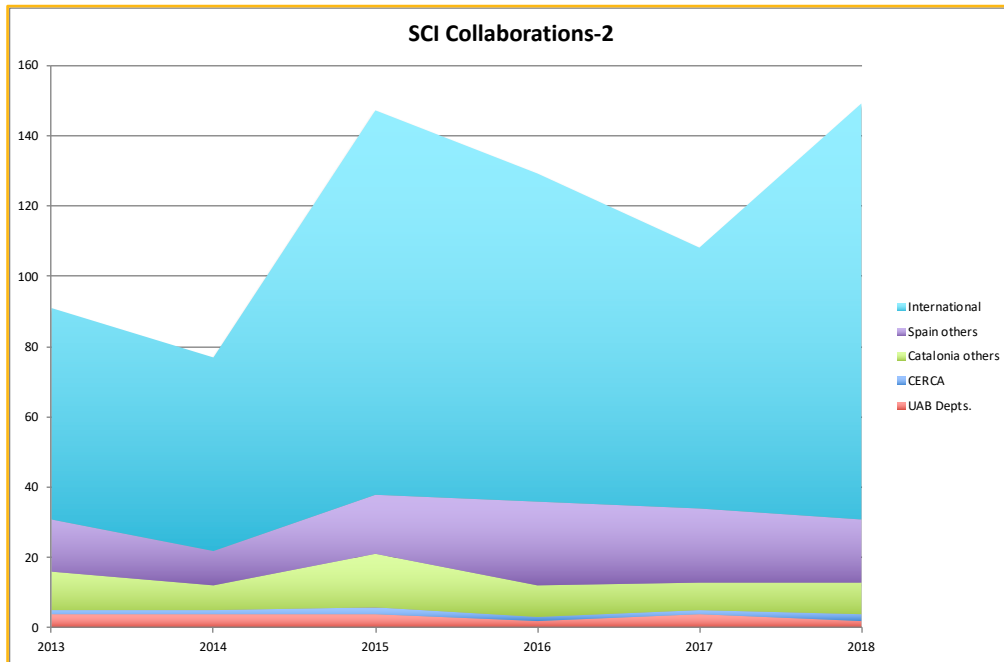


Collaborations. As measured by the number of papers with or without collaborations, there is a clear trend toward increasing international collaborations, decreasing ICP only papers, and the maintenance to slight decrease of national collaborations. As a result, international collaborations in 2018 were higher in absolute terms than the average of the five preceding years, and higher than ever (up to 80%) in relative terms.



SCI PRODUCTION WITH COLLABORATIONS (2013–2017 vs. 2018)							
PRODUCTION ACCORDING TO COLLABORATIONS	2013	2014	2015	2016	2017	AVERAGE	2018
SCI papers – ICP only	8	18	9	15	4	10.8	4
SCI papers – non-international collaboration	12	11	14	13	13	12.6	8
SCI papers – international collaboration	31	32	49	52	46	42.0	48
SCI papers – ICP only (%)	15.7	30.5	12.5	18.8	6.3	16.6	6.7
SCI papers – non-international collaboration (%)	23.5	18.6	19.4	16.3	20.6	19.4	13.3
SCI papers – international collaboration (%)	60.8	54.2	68.1	65.0	73.0	64.6	80.0

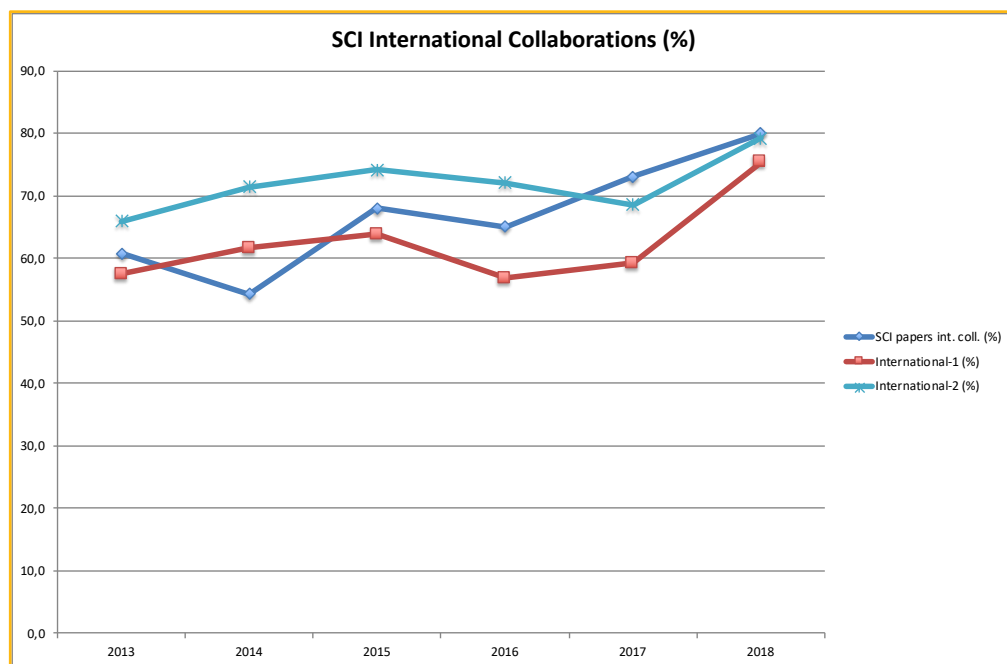




As measured by the two other metrics explained above (collaborations 1 and 2), which rely on the number of non-ICP affiliations of ICP coauthors in SCI papers, the figures for 2018 are higher than the average five preceding years. Although there is no progressive increase in international collaborations, with two peaks in 2015 and 2018, it is noteworthy that international collaborations in 2018 are not only higher than average, but also higher than in any previous year (including 2015) both in absolute and relative terms. It is therefore warranted to conclude that international collaborations were never higher than they currently are.

SCI COLLABORATIONS (2013–2017 vs. 2018)							
COLLABORATIONS-1	2013	2014	2015	2016	2017	AVERAGE	2018
Total collaborations	127	120	227	206	179	171.8	199
UAB Departments	10	9	8	13	12	10.4	5
CERCA centers	3	3	9	6	5	5.2	7
Catalonia others	18	12	31	21	22	20.8	14
Spain others	23	22	34	49	34	32.4	23
International	73	74	145	117	106	103.0	150
UAB Departments (%)	7.9	7.5	3.5	6.3	6.7	6.1	2.5
CERCA centers (%)	2.4	2.5	4.0	2.9	2.8	3.0	3.5
Catalonia others (%)	14.2	10.0	13.7	10.2	12.3	12.1	7.0
Spain others (%)	18.1	18.3	15.0	23.8	19.0	18.9	11.6
International (%)	57.5	61.7	63.9	56.8	59.2	60.0	75.4

SCI COLLABORATIONS (2013–2017 vs. 2018)							
COLLABORATIONS-2	2013	2014	2015	2016	2017	AVERAGE	2018
Total collaborations	91	77	147	129	108	110.4	149
UAB Departments	4	4	4	2	4	3.6	2
CERCA centers	1	1	2	1	1	1.2	2
Catalonia others	11	7	15	9	8	10.0	9
Spain others	15	10	17	24	21	17.4	18
International	60	55	109	93	74	78.2	118
UAB Departments (%)	4.4	5.2	2.7	1.6	3.7	3.3	1.3
CERCA centers (%)	1.1	1.3	1.4	0.8	0.9	1.1	1.3
Catalonia others (%)	12.1	9.1	10.2	7.0	7.4	9.1	6.0
Spain others (%)	16.5	13.0	11.6	18.6	19.4	15.8	12.1
International (%)	65.9	71.4	74.1	72.1	68.5	70.8	79.2



PhD Dissertations

Two PhD dissertations by ICP researchers were finished in 2018 (these should not be mistaken with the theses supervised by ICP researchers, which may further include other dissertations performed by PhD candidates from other institutions; see the relevant subsection on supervision later in this document); they are the following:

- **Carmen Nacarino-Meneses:** Title: “Life histories en perisodáctilos actuales y extintos” | Supervisors: M. Köhler (ICP), X. Jordana (UAB, ex-ICP).
- **Víctor Vinuesa:** Title “Endocranial morphology of the extinct bone-cracking hyenids” | Supervisors: J. Madurell-Malapeira (ICP), David M. Alba (ICP).

Fieldwork

Paleontological fieldwork constitutes an essential component of the research performed by ICP researchers, given that fossils constitute the basic raw data for our research. Even if fieldwork results are not immediately reflected in ICP publications, this activity further results in the corresponding field reports and memoirs that are supplied to the Archeological and Paleontological Survey of the Culture Department of the Generalitat de Catalunya.

The following programmed paleontological interventions were performed in 2018 by the ICP, being partially funded by the new fieldwork grants from the Culture Department of the Generalitat de Catalunya for the quadrennium 2018–2021:

- **Guils del Cantó, punt km 255 de la N-260:** Consolidation/restoration/conditioning | Municipality: Montferrer i Castellbó | Age: Triassic | Directors: E. Mujal.
- **Collada del Tossal del Pollerini:** Prospection | Municipality: el Pont de Suert | Age: Triassic | Directors: E. Mujal & A. Bolet.
- **Penya Rubí-Puigventòs:** Prospection | Municipality: Vallirana & Vacarisses | Age: Triassic | Directors: E. Mujal, A. Bolet & J. Fortuny.
- **Terme municipal del Brull:** Prospection | Municipality: el Brull | Age: Triassic | Directors: E. Mujal & A. Bolet.
- **Pedrerres del Montsec:** Excavation | Municipality: Vilanova de Meià | Age: Early Cretaceous | Directors: À. Galobart.
- **Serrat del Rostiar II:** Excavation | Municipality: Isona i Conca Dellà | Age: Late Cretaceous | Directors: R. Gaete.
- **Costa de la Serra:** Excavation | Municipality: Isona i Conca Dellà | Age: Late Cretaceous | Directors: A. Prieto-Márquez & A.G. Sellés.
- **Els Nerets:** Excavation | Municipality: Tremp | Age: Late Cretaceous | Directors: B. Vila.
- **Espinau:** Excavation | Municipality: Àger i Les Avellanes i Santa Linya | Age: Late Cretaceous | Directors: À. Galobart & A. Prieto-Márquez.
- **Sant Romà d'Abella:** Excavation | Municipality: Isona i Conca Dellà | Age: Late Cretaceous | Directors: A. Prieto-Márquez & A.G. Sellés.
- **Conca de Tremp:** Prospection | Municipality: Isona i Conca Dellà, Abella de la Conca, Talarn & Tremp | Age: Late Cretaceous | Directors: À. Galobart & R. Gaete.
- **Dipòsits continentals del Paleocè de les àrees de Tremp i Camarasa:** Prospection | Municipality: Tremp & Camarasa | Age: Paleocene | Directors: J. Marigó & R. Minwer-Barakat.
- **Els Casots:** Excavation | Municipality: Subirats | Age: early Miocene | Directors: I. Casanovas-Vilar & David M. Alba.
- **Creu de Conill:** Excavation, sampling, and prospection | Municipality: Terrassa | Age: late Miocene | Directors: S. Almécija, S. Moyà-Solà and M. Pina.
- **Incarcal:** Prospection, excavation and sampling | Municipality: Crespà | Age: Early Pleistocene | Directors: J. Madurell-Malapeira & B. Martínez-Navarro.

- **Grotte de la Carrière:** Excavation | Municipality: Corneilla de Conflent (França) | Age: Pleistocene | Directors: J. Madurell-Malapeira.

Awards

In the 3rd edition of Nit de la Biologia in July 2018, ICREA Research Professor and former ICP Director, Salvador Moyà-Solà, received the 'professional trajectory award' from the Societat Catalana de Biologia (SCB). In the same edition, the team from documentary "L'últim gegant d'Europa", including the Head of the Communication & Outreach Department of the ICP (Pere Figuerola), performed in collaboration by Batabat, TV3 and the ICP with funds from FECYT, was awarded the 'dissemination award' from SCB.

Four former PhD grantees received in June 2018 the Extraordinary Doctorate Awards by the UAB: Blanca Moncunill-Solé (2015-2016, Biodiversity), Àngel H. Luján (2015-2016, Geology), Víctor Fondevilla (2016-2017, Geology), and Alejandro Blanco (2016-2017, Geology).

FUNDRAISING

Inspiration and innovation when seeking financial support

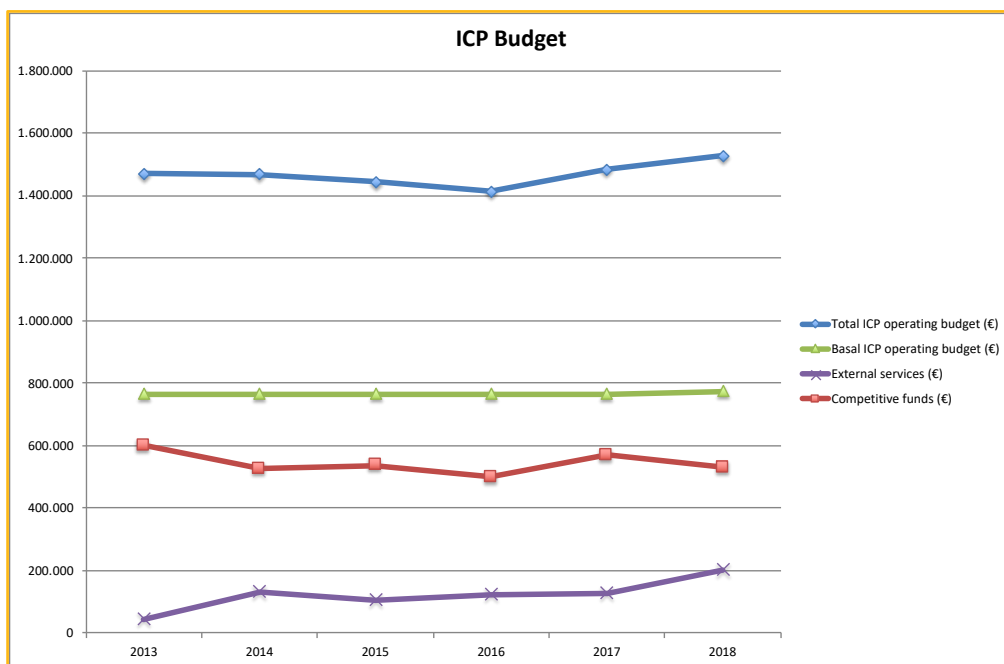
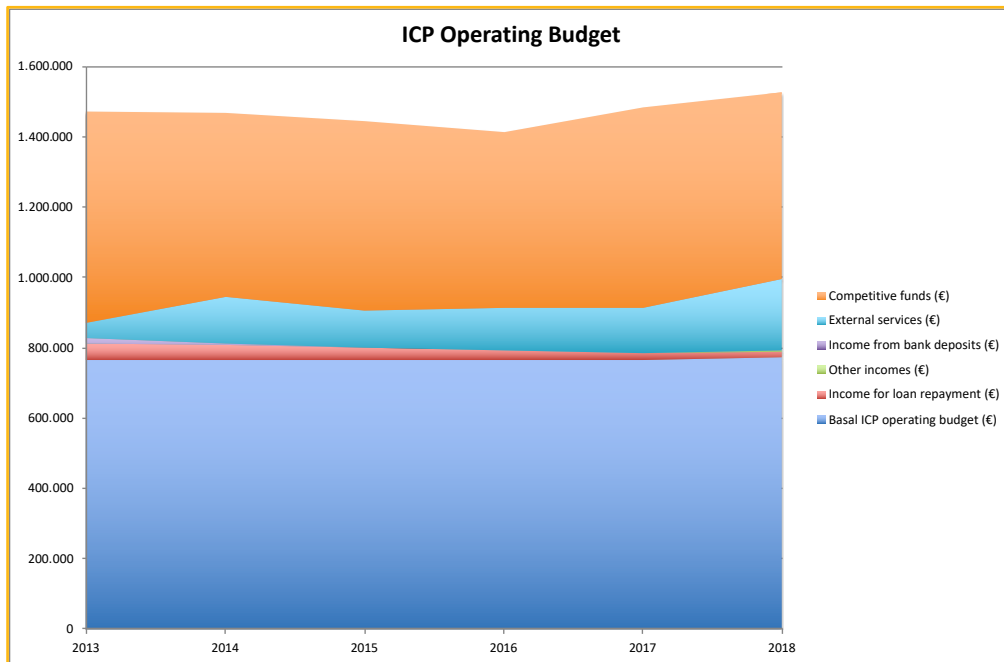
Competitive funds and provision of services

The ICP operating budget (i.e., excluding investments) includes the basal budget endowed by the Generalitat de Catalunya as well as the monetary income obtained by the ICP from other sources. The latter can be divided into several categories, such as competitive funds, revenues generated by the provision of external services, or income from bank deposits (although the latter is negligible). Furthermore, from 2007 to 2011, the ICP also received a significant income from the Diputació de Barcelona associated with the museum order management (i.e., to cover the expenses generated by the ICP Museum after its transferral to the Generalitat de Catalunya). However, this amount extinguished after 2011 and was not reflected in a concomitant increase in the basal budget provided by the Catalan government.

As in the latter years, the two main sources of income for the ICP (other than its basal budget) in 2018 consisted of competitive funds and the provision of external services. Competitive funds refer to projects and grant applications that are evaluated on a competitive basis by external funding agencies, either public or private. A vast majority of competitive funds are associated with research activity, although sometimes they are associated to other activities performed at the ICP, such as research support or scientific dissemination and outreach. Revenues provided by the provision of external services to third parties (either public or private) are not competitive in this sense, although they imply competition with other institutions as well as private companies in the framework of market rules. These activities are mostly related to knowledge transfer, and therefore will be discussed in further detail later in this document. Be that as it may, ultimately competitive funds and external services jointly reflect the fundraising capacity of the ICP, and are worth being reported here together before going into their particulars.

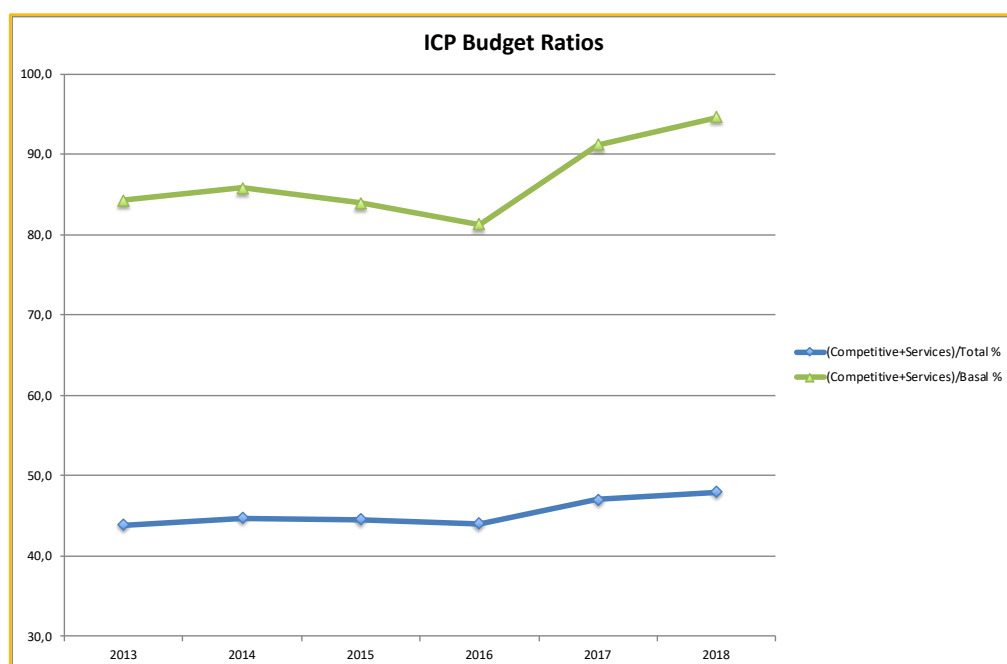
Total operating budget. The total operating budget of the ICP has remained quite stationary since the last significant decrease of the basal operating budget from 2012 to 2013. However, the figure from 2018 is somewhat higher than that of the preceding five years. Such an increase is basically attributable to a significant increase in service provision, and to a much lower extent to the slight increase in the basal operating budget (thanks to an additional financial envelope from the Generalitat de Catalunya to increase the wages of the structural personnel).

OPERATING BUDGET (2013–2017 vs. 2018)							
BUDGETARY INCOMES	2013	2014	2015	2016	2017	AVERAGE	2018
Total operating budget (€)	1,470,792	1,467,881	1,442,987	1,412,922	1,482,826	1,455,482	1,526,060
Basal operating budget (€)	765,437	765,437	765,500	765,500	765,500	765,475	774,070
Income for loan repayment (€)	48,164	43,786	34,896	25,221	19,467	34,307	15,091
Other incomes (€)	0	0	0	0	0	0	4,676
Income from bank deposits (€)	11,991	1,749	0	0	0	2,748	0
Provision of external services (€)	45,531	131,888	105,259	123,872	128,416	106,993	202,317
Competitive funds (€)	599,669	525,021	537,332	498,329	569,443	545,959	529,905



Budget ratios. Competitive funds and external services can be considered together relative to the total and basal budgets by means of percentual ratios. It emerges that, in 2018, the former were close to represent the 50% of the total budget (48%), and approached, but did not reach, the amount of the total budget (95%). These figures are slightly above the average for the five preceding years, and indeed represent the most favorable ratios reached so far— even if still below the desirable ratios of >50% and >100%, respectively.

BUDGET RATIOS (2013–2017 vs. 2018)							
RATIOS	2013	2014	2015	2016	2017	AVERAGE	2018
(Competitive+External services)/Total %	43.9	44.8	44.5	44.0	47.1	44.9	48.0
(Competitive+External services)/Basal %	84.3	85.8	83.9	81.3	91.2	85.3	94.6



Competitive funding sources

Spanish Government. Most of the competitive funds for research at the ICP come from the former’s Spanish MINECO Agencia Estatal de Investigación (currently within the Ministerio de Ciencia, Innovación y Universidades), by means of multiannual R+D projects that are financed with funds from the European Regional Development Fund. They are the following.

- “Evolución del ciclo vital de los mamíferos en ecosistemas ibéricos continentales del Mioceno al Pleistoceno” (CGL2015-63777-P) | P.I.: M. Köhler, J. Quintana Cardona | Duration: 2016–2018.
- “Ecological web models for the last dinosaurs of Europe” (CGL2016-77230-P) | P.I.: À. Galobart | Duration: 2017–2019.

- “Dinámica de la paleobiodiversidad de las faunas de vertebrados fósiles del Vallès-Penedès y comparación con otras cuencas miocenas” (CGL2016-76431-P) | P.I.: D.M. Alba, D. DeMiguel | Duration: 2017–2020.
- “Los primates del Cenozoico de la Península Ibérica: evolución, aspectos paleoambientales y paleobiogeográficos” (CGL2017-82654-P) | P.I.: S. Moyà-Solà, R. Minwer-Barakat | Duration: 2018–2020.

Research at the ICP is also funded by former MINECO by means of cofunded contracts for postdoc (‘Ramón y Cajal’ and ‘Juan de la Cierva’) and predoc (FPI) researchers as well as technicians (PTA), coupled with predoc (FPU) contracts from the Spanish Ministerio de Educación y Formación Profesional. The following grants/contracts were active in 2018:

- Xènia Aymerich (PTA2014-09366-I) | Modality: PTA technician | Duration: 2015–2018 (3 years).
- Guillem Pons-Monjo (PTA2015-10789-I) | Modality: PTA technician | Duration: 2016–2019 (3 years).
- Marina Rull (PTA2015-10417-I) | Modality: PTA technician | Duration: 2017–2020 (3 years).
- Alessandro Urciuoli (BES-2015-071318) | Modality: FPI predoc | Duration: 2015–2019 (4 years).
- Teresa Calderón (BES-2016-078938) | Modality: FPI predoc | Duration: 2016–2020 (4 years).
- Rafel Matamales-Andreu (FPU17/01922) | Modality: FPU predoc | Duration: 2018–2022 (4 years).
- Judit Marigó (IJCI-2015-26392) | Modality: JdC postdoc | Duration: 2016–2018 (2 years).
- Isaac Casanovas-Vilar (RYC-2013-12470) | Modality: RyC researcher | Duration: 2014–2019 (5 years).
- Albert Prieto-Márquez (RYC-2015-17388) | Modality: RyC researcher | Duration: 2017–2022 (5 years).

Generalitat de Catalunya. A large proportion of the competitive funding provided by the Generalitat de Catalunya in 2018 comes from various fieldwork grants from the Department of Culture, active from 2018 to 2021 (indeed, these funds were granted in December 2018, but with retroactive effects beginning in January). They are the following:

- “Evolució dels ecosistemes durant la transició Paleozoic-Mesozoic a Catalunya” (CLT009/18/00066) | P.I.: J. Fortuny | Duration: 2018–2021.
- “Xarxes paleoecològiques dels jaciments amb dinosaures del Cretaci català” (CLT009/18/00067) | P.I.: À. Galobart | Duration: 2018–2021.
- “El jaciment paleontològic dels Casots, un ecosistema de fa 16 milions d’anys. Recerca, recuperació patrimonial i socialització” (CLT009/18/00068) | P.I.: I. Casanovas-Vilar | Duration: 2018–2021.

- “Els primats i altres vertebrats del Paleogen de Catalunya” (CLT009/18/00069) | P.I.: J. Marigó | Duration: 2018–2021.
- “La transició del Pleistocè inferior-mitjà a Catalunya” (CLT009/18/00070) | P.I.: J. Madurell-Malapeira | Duration: 2018–2021.
- “Els primats fòssils del Miocè de la conca del Vallès-Penedès” (CLT009/18/00071) | P.I.: S. Moyà-Solà | Duration: 2018–2021.

Also remarkable are various grants provided by the Catalan Government to the ICP, generally in relation to the management of the Conca Dellà Museum, the ICP collections or particular fossil sites:

- “Gestió mancomunada de “Dinosaures dels Pirineus” - Museu de la Conca Dellà i Espai Dinosfera” (CLT9123/18/00017) | OSIC, Departament de Cultura, Generalitat de Catalunya | Duration: 2018.
- “Proposta d’actuacions programades per a la realització del registre, inventari, documentació, catalogació i digitalització de la col·lecció de l’ICP” (CLT052/18/00018) | OSIC, Departament de Cultura, Generalitat de Catalunya | Duration: 2018.
- “Curs de divulgació del registre permian i triàsic pirinenc - Parc de l’Alt Pirineu” (Exp. 10 02030 2018 04) | Departament de Territori i Sostenibilitat, Generalitat de Catalunya | Duration: 2018.

Research at the ICP is also funded by the Agència de Gestió d’Ajuts Universitaris i de Recerca (AGAUR) of the Department of Business and Knowledge (Generalitat de Catalunya) by means of a series of predoctoral and postdoctoral (‘Beatriu de Pinós’) grants (the latter were granted in 2018 but the contracts will start in 2019):

- Víctor Vinuesa (2015FI_B00088) | Modality: FI predoc | Duration: 2015–2018 (3 years).
- Guillem Orlandi (2016 FI_B00202) | Modality: FI predoc | Duration: 2016–2019 (3 years).
- Sílvia Jovells-Vaqué (2017 FI_B 00054) | Modality: FI predoc | Duration: 2017–2020 (3 years).
- Rafel Matamales-Andreu (2018 FI_B 00060) | Modality: FI predoc | Duration: 2018 (3 years, renounced after 5 months).
- Diego Castanera (2017 BP 00195) | Modality: BP postdoc | Duration: 2019-2020 (2 years).
- Judit Marigó (2017 BP 00003) | Modality: BP postdoc | Duration: 2019-2021 (2 years).
- Juan Abella (2017 BP 00223) | Modality: BP postdoc | Duration: 2019-2021 (2 years).

It is noteworthy that three research groups of the ICP were granted the recognition as Consolidated Research Group by AGAUR, but without an accompanying associated budget (these recognitions were granted in 2018 with retroactive effects for 2017 and being extended an additional year until 2020):

- “Paleoprimatologia i paleontologia humana (PIPH)” (2017 SGR 00086 GRC) | P.I.: S. Moyà-Solà | Duration: 2017–2020.
- “Neogene and Quaternary Vertebrate Paleobiodiversity (NQVP)” (2017 SGR 00116 GRC) | P.I.: D.M: Alba | Duration: 2017–2020.

- “Paleoecology and Evolutionary Biology (PEB)” (2017 SGR 00960 GRC) | P.I.: M. Köhler | Duration: 2017–2020.

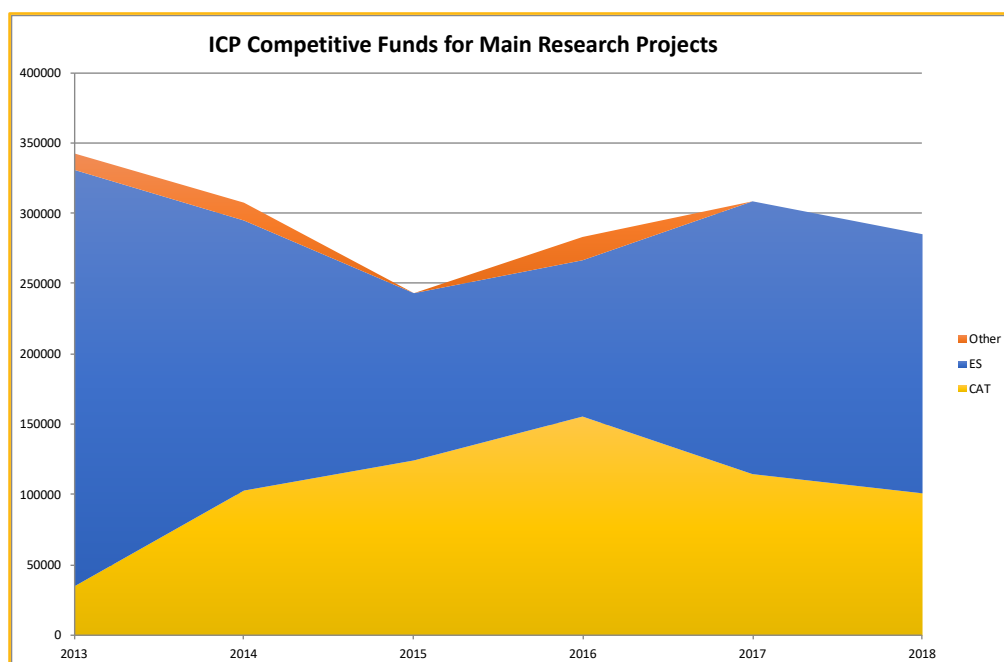
Other public funds. In 2018 the ICP also received a small grant from a city council in relation to the management and excavation of a fossil site:

- “Projecte d’actuació paleontològica al jaciment dels Casots” (D220180010628) | P.I.: I. Casanovas-Vilar | Duration: 2018.

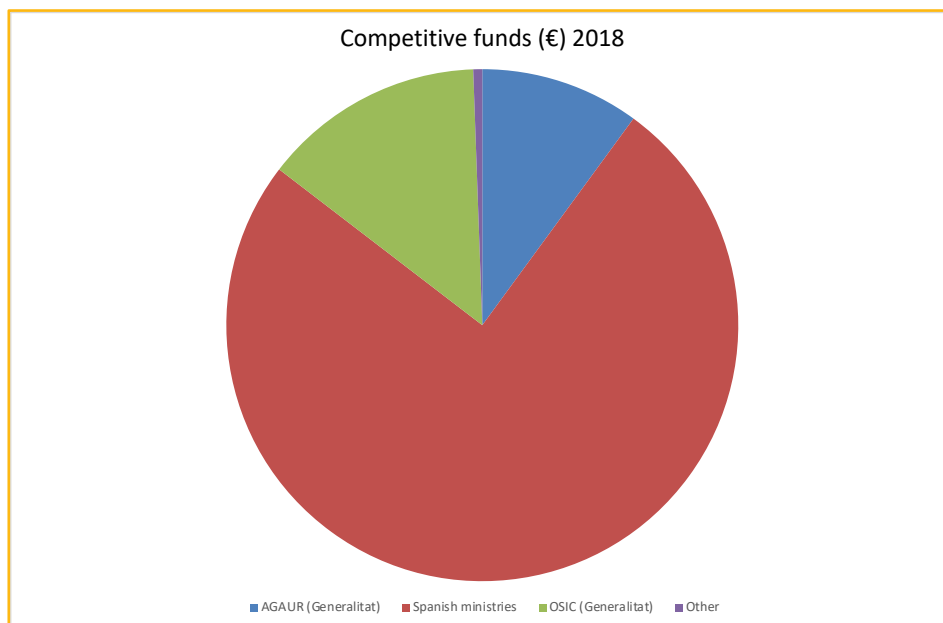
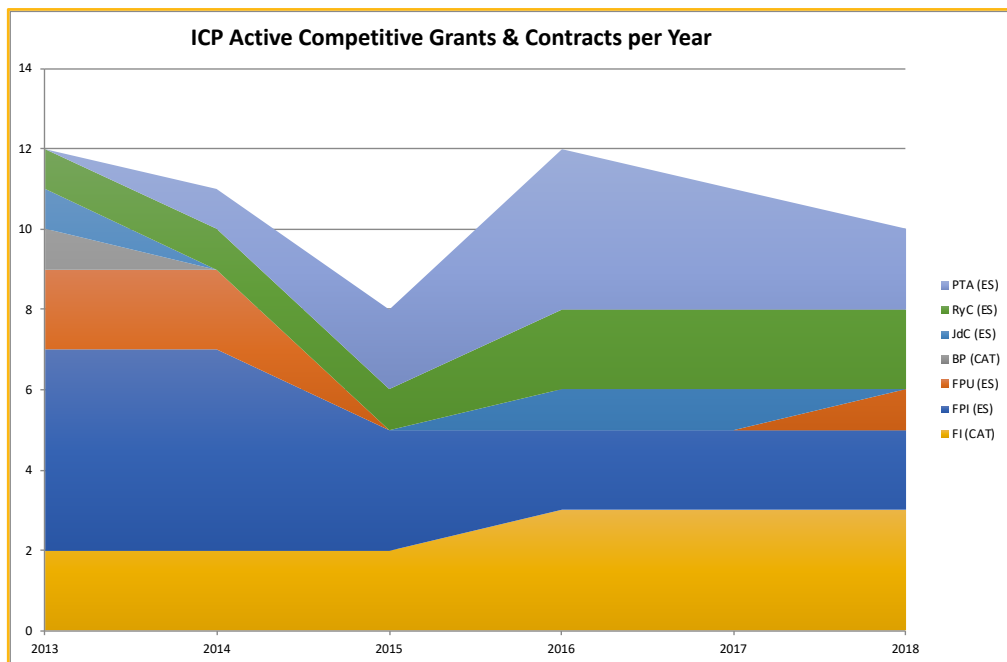
Comparisons. The significance of the Catalan Government (CAT) as a competitive funding source for the ICP is compared below with that of other funding sources from the Spanish Government by means of focusing research projects above 10,000 € and distributing equally the total amount of each project by the various years of its duration.

COMPETITIVE FUNDING SOURCES (2013–2017 vs. 2018)							
FUNDING SOURCE	2013	2014	2015	2016	2017	AVERAGE	2018
Generalitat de Catalunya (CAT)	34,340	102,446	124,446	155,061	114,113	106,081	100,505
Spanish Government (ES)	296,990	192,123	118,990	111,432	194,799	182,867	184,565
Other	11,571	12,533	0	16,823	0	8,185	0
TOTAL	342,901	307,102	243,436	283,316	308,911	297,133	285,071

The results show the overall level of funding is only slightly below the average for the five preceding years, and that this is attributable to a somewhat lower amount of funding from the Generalitat de Catalunya (and especially the lack of funding for the SGR), since the funding from the Spanish Government in 2018 is virtually identical to the corresponding average for 2013–2017.



With regard to individual grants and contracts (both predoctoral and postdoctoral), comparisons focus on the number of active grants per year. It can be seen that reasonably good levels of predoc scholarships have been maintained until 2018, thanks to both AGAUR and MINECO; that the ICP is currently more successful in the ‘Ramón y Cajal’ program than in postdoctoral programs such as ‘Juan de la Cierva’ and, especially, ‘Beatriu de Pinós’; and that, during the last years, we have been particularly successful in the PTA program for cofunding of technicians. What the plot does not reflect yet is that three new BP postdocs were granted in 2018, although they will not join the ICP until 2019.

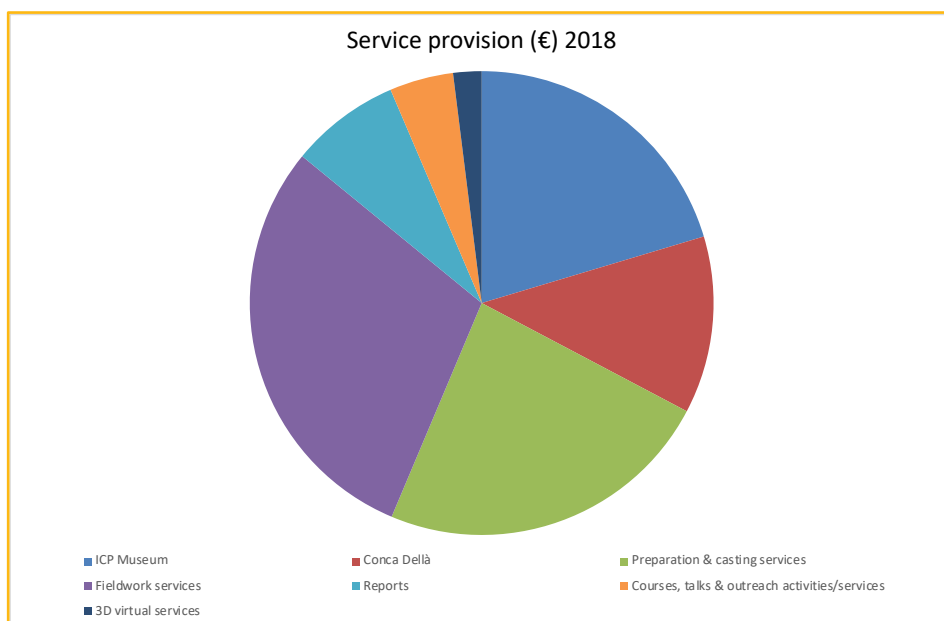


When all types of grants (research projects and contracts) are considered together, it can be seen that funding provided by the Spanish government represented in 2018 about 95% of the ICP competitive funds, whereas that provided by the Generalitat de Catalunya represented less than 25% (10% AGAUR and 14% OSIC).

Provision of services

Approximately 37% of the income from the provision of services in 2018 is associated with museum and outreach activities, either those of our own Museum in Sabadell (20%, including tickets, museum shop, guided visits/workshops, and other outreach activities) or those related to the Conca Dellà Museum in Isona and Diosfera in Coll de Nargó (12%, including both management and personnel), plus other activities (including talks and courses, 4%). The remaining income must be considered external services in a strict sense, mainly corresponding to preparation and casting services (24%), fieldwork services (30%), reports (8%), and virtual services (2%).

PROVISION OF SERVICES (2018)	
SERVICES	AMOUNT (€)
ICP Museum tickets	8,576.52
ICP Museum shop	9,234.86
ICP Museum guided visits & workshops	23,389.59
Conca Dellà Museum management	4,952.00
Conca Dellà Museum personnel	20,055.67
Preparation & casting services	47,794.03
Fieldwork services	59,807.88
Reports	15,500.00
Courses, talks, & outreach activities/services	9,006.25
3D virtual services	4,000.00
TOTAL	202,316.80



As compared to 2017, it is most noteworthy the increase in preparation/casting services (from 30 to 48 k€) and, especially, fieldwork services (from 17 to 60 k€), which to a large extent explain the overall increase in service provision income from 128 k€ in 2017 to 202 k€ in 2017 (with represents a 58% increase).

Big science

The Jurassic Project. In November 2018 the ICP applied to a large-scale research and outreach project led by The Children's Museum of Indianapolis (TCM), USA, which is the world's largest museum for children and families. After some preliminary conversations, on May 2018 the President and CEO of the TCM (Jeffrey H. Patchen) and the P.I. of the project (Prof. Phil Manning from the University of Manchester, UK) visited the ICP and personally met with the Director, various members of the Mesozoic Faunas Research Group (including its leader, Dr. Àngel Galobart), and the Head of the Research Support & External Services Dept. (Dr. Josep Fortuny), in order to discuss the possibility to collaborate on the aforementioned project, entitled 'The Jurassic Project'. The TCM was looking for a select group of strategic partners among the world's top natural history museums and universities devoted to paleontology, in order to participate in the exploration and discovery of extraordinary Jurassic dinosaurs from one of the largest and potentially most important dinosaur-bearing new Jurassic sites, located in the Morrison Formation in North America.

This long-term and large-scale project, with an estimated budget of 23-30 M\$ for 20 years (5 M\$ for 2019-2023), aims to engage dinosaur paleobiology research groups from over the world (USA, UK, The Netherlands, New Zealand, Japan, Spain...) to perform both research and dissemination to the highest international level. The TCM Jurassic Site is exceptional in terms of its richness, extension, fossil bone quality and preservation (including abundant articulated skeletons), the number of specimens exposed (including dinosaur body fossils and trackways, as well as plant remains), and is only 90 min away from Yellowstone National Park. TCM has invested in a 20-year lease with the landowners for full rights to all fossils from this 640-acre site in northern Wyoming, with the aim to populate a new Jurassic dinosaur exhibit (to complement the already successful Cretaceous 'Dinosphere'), in collaboration with an international team of top paleontologists that by means of research would contribute to the valorization of the fossils. TCM offers to their partners collaboration in fieldwork, acquisition of loan specimens to go on display at partner institutions, and participation in the research for publication in high-impact journals, among others, and requests to partner institutions a five-year commitment regarding human, financial and in-kind resources to the Jurassic Project.

The fact that the ICP has been invited to participate in this project (together with other renowned institutions such as the Natural History Museum of London, among others) confirms the status of the ICP as a benchmark paleontological research center at a global level. Undoubtedly it represents an optimal opportunity to maximize, in years to come, the international visibility and research impact of the ICP, with very promising consequences for

reinforcement and further consolidation of its Mesozoic Faunas Group in particular. Due to budgetary restrictions, the ICP cannot provide direct funds to the project and should engage donors and exponents to fund the participation of ICP researchers, technicians and volunteers in the fieldwork activities in the USA. Nevertheless, the fact that ICP can significantly contribute to the project in terms of fieldwork and research expertise offers good prospects to be eventually accepted as strategic partner. If this is finally the case, the participation of the ICP in the Jurassic Project, given the interest raised by dinosaurs and the invaluable help of TCM in engaging donors, will represent a previously unprecedented opportunity for our institution to raise both public and private funds outside the regular competitive calls to which the ICP normally applies (see next section).

Donors and sponsors

Patronage. The ICP benefits from the patronage provided by the trustees, either in monetary form (the funds for the basal operating budget provided by the Generalitat de Catalunya) or the form of in-kind incomes received by public institutions (including the two patrons, the Generalitat de Catalunya and Universitat Autònoma de Barcelona, as well as other institutions and individuals; see below).

However, the ICP currently benefits from no philanthropic or relevant sponsorship monetary donations to perform its mission. The only sponsorship received in 2018 consisted in chemicals given by Sagristà Productus to sponsor a course on the casting of cultural objects organized by the ICP. Given the limited success of patronage and sponsorship initiatives of the ICP in previous years, the Strategic Plan emphasized the need to boost service provision as the most promising way increase the total operating budget of the ICP. However, beginning in 2019, renewed efforts should be devoted to other fundraising initiatives. In this sense, the aforementioned Jurassic Project (if the ICP is eventually accepted as partner) offers an unparalleled opportunity in this regard, given the huge scope of the project and especially the invaluable help that TCM would be able to offer in this regard.

Even though Catalonia has some tradition in philanthropic actions, as regards to science these are largely restricted to biomedical research, for which both lay people and companies can more easily appreciate societal benefits related to human health and well-being. Donations to other initiatives related to more basic scientific research have a much less well-established tradition, although there are some factors that allow us to be moderately optimistic in this regard: (a) Vertebrate fossil remains are considered cultural heritage by law in Catalonia, and societal sensibility toward cultural heritage is in general much higher than that toward scientific research outside the realm of biomedicine; (b) Fossils of vertebrates, and particularly those of dinosaurs (and primates), have always caught the attention of the general public, so that new finds and exhibits can reach the headlines with ease; (c) previous initiatives undertaken by the ICP to seek donors and sponsors were insufficiently planned and lack enough long-term support, so there ground for improvement, particularly if we have the

guidance of TCM; and (d) multinational corporations of Catalan origin are likely to be more interested in contributing to a large-scale project that offers the prospect of publicizing their company beyond a local/regional scale; and (e) based on the previous experience of the ICP, some sponsorship activities could be vehiculated as service provision (e.g., the revenues generated by the organization of temporary exhibits for others institutions).

If accepted as a strategic partner of the Jurassic Project, the ICP will have to try to all of the relevant corporations and philanthropic individuals with an attested record of actively engaging in philanthropical actions related to science and/or cultural heritage in Catalonia and Spain. In this regard, the ICP will need the support of the CERCA institution as well as the ICP Board of Trustees. Indeed, one of the recommendations provided by the CERCA Evaluation Commission to the ICP in 2018 consists in asking the Board of Trustees for support to seek donors.

In-kind income. The in-kind income received by the ICP during 2018 includes the following:

- Two ICREA research professors are seconded to the ICP: Prof. Salvador Moyà-Solà, Head of the Paleoprimatology & Human Paleontology Research Group; and Prof. Meike Köhler, Head of the Evolutionary Paleobiology Research Group.
- Several civil servants of the Generalitat de Catalunya are ascribed to the ICP: Dr. Àngel Galobart, Head of the Mesozoic Faunas Research Group; Teresa Esquirol, Head of the Museum Area; Teresa Requena, archivist and documentalist; and Manel Llenas, maintenance and field technician.
- The Universitat Autònoma de Barcelona grants to the ICP personnel access to the UAB network and, hence, to the vast collection of digital documents subscribed by the university, including not only subscription journals and books, but also bibliometric databases such as the Web of Science/Journal Citation Reports and Scopus. The ICP researchers also have access to the Scientificotechnical Services of the UAB at reduced fees.
- The Universitat Autònoma de Barcelona, by means of its Library Services, allows the ICP to use its digital repository ('Dipòsit Digital de Documents de la UAB', DDD) to host its open access research outputs in a distinctive collection (<https://ddd.uab.cat/collection/icp>) that highlights the singularity of the ICP.
- The Universitat Autònoma de Barcelona defrays part of the direct costs generated by the ICTA-ICP building (maintenance, cleaning, surveillance, concierge service, electricity, water, conditioning, etc.) that are attributable to the ICP (30.44%), by virtue of an agreement that regulates the use of premises and which was signed in December 2016 with retroactive effects back to June 2014. In particular, the ICP assumes up to 80,000 €/yr, and the UAB pays the rest, for a period of five years that can be extended by mutual agreement of the parties.

- The Generalitat de Catalunya lends to the ICP the use of the building in Sabadell where the ICP Museum and several premises for researchers and technicians are located, as well as of the Can Llobateres parcel (where the homonymous site and screen-washing facilities are located). This real estate was formerly owned by the Diputació de Barcelona and was transferred to the Generalitat de Catalunya in 2008, to be operated by the ICP indefinitely.
- The Ajuntament de Sabadell lends to the ICP the use of municipal premises to be used as a storehouse for unprepared fossil material. Since 2018 these premises are situated in Blasco de Garay street.
- Multiple individual volunteers help the ICP personnel with several administrative, communication and technical tasks.
- A second-hand Discovery Land Rover was donated in 2018 to the ICP, being currently used as the main four-wheel drive all-terrain vehicle for off-road driving during fieldwork.

RESEARCH SUPPORT AND KNOWLEDGE TRANSFER

Multiple areas with vocation of service

Research support

The paleontological services provided by various areas of the Research Support & External Services Department are fundamental for accomplishment of the research aims of the research groups of the ICP. Furthermore, as evidenced in the previous section, the Preparation & Conservation Area and the Fieldwork & Collections Management Area are very important from the viewpoint of knowledge transfer as well, by means of the provision of external services. Knowledge transfer activities, however, are not restricted to external services that result in monetary revenues, since they further include a series of other activities that are mostly related to training as well as outreach activities performed at the ICP Museum and beyond. Below, the activities restricted to research support and reported first, and subsequently we focus on knowledge transfer activities divided into two main categories: training and paleontological services.

Preparation and conservation. During 2018, the preparator technicians of the Preparation & Conservation Area have prepared more than 1727 remains in the framework of the support provided to ICP researchers. The prepared fossils mostly come from the following sites:

- Cala Pilar.
- Móra d'Ebre.
- Pontils.
- Els Casots.
- Cases de la la Valenciana.
- Abocador de Can Mata.
- Creu de Conill (campaigns 2017 and 2018).
- Can Pallars i Llobateres.
- Torrent de les Febulines.
- Vallparadís Estació.
- Incarcal.
- Cal Guardiola.

Other research support actions performed by our preparators include molding, casting, large-sized rigid packaging, special packaging for transport/shipping, as well as the writing of conservation reports.

Collection management. During 2018, 3,240 new catalog numbers have been registered into the inventory of the ICP collections, of which 3,181 have been included in Museum Plus (the

museographic software used by Catalan Museums); 501 catalog numbers have been modified during the same period. A total of 64 petitions to study materials from the ICP collections have been attended by the Collections Management Area of the ICP, of which 15 internal and 31 external. Finally, 18 loans of original material and/or casts have been done for exhibits or activities organized by other institutions.

Fieldwork. The programmed paleontological excavations directed by ICP researchers in the framework of research projects have been already reported in a previous section and need not be repeated here. However, it is noteworthy that several of these interventions have been performed with the aid of the human resources of the Fieldwork and Collections Management Area, including its head, the fieldwork officer, and various field technicians.

Virtual paleontology. In 2018, ICP researchers from several research groups benefited from the assistance of a specialized technician from the 3D Virtual Lab of the Virtual Paleontology Area concerning the processing of 3D virtual reconstructions based on CT and photogrammetry data. Most of the time devoted by the 3D Virtual Lab to research support was related to the segmentation of craniodental remains of both extant and fossil vertebrates (reptiles and mammals), although part of the time was also devoted to photogrammetry, performing CT scans in other institutions, repositioning 3D models for reconstructing fossil specimens, and preparing material for publications (e.g., videos of 3D reconstructions). Several scans were performed at the μ CT scanners from Burgos (Spain) or Trieste (Italy).

Paleontological services

The paleontological services provided by the ICP are based on the know-how of both its technicians and researchers (including their knowledge, expertise and skills), which are offered to external parties in exchange of monetary revenues that contribute to the total operating budget of the ICP. These 'customers' include individual persons or groups of people, public entities, and private companies alike. Even though these paleontological services appear quite varied, in general they resemble the internal research support services that are regularly provided to the ICP research groups by the various areas of the Research Support & External Services Department. In a broad sense, the museum exhibits and outreach activities organized by the ICP may also be considered paleontological services, as they also originate revenues for the institution.

Museum services. The ICP Museum in Sabadell is an indispensable requirement for the research performed at the ICP, which needs a museum officially recognized as such by the Generalitat de Catalunya to be the depositary of its fossil collections. Having a museum is also a very powerful tool from the viewpoint of scientific dissemination and outreach, to transmit paleontological knowledge to the general public. Although these activities are performed in compliance with one of the missions of the ICP (promoting the dissemination of the

paleontological heritage from Catalonia), it is also noteworthy that these activities (including guided visits, workshops, and products sold at the museum shop) generate some revenues, which at least in part serve to alleviate the costs of the required personnel to maintain the museum open to the public. The fees for museum entrance tickets, guided visits for groups and schools, and the various workshops offered to either families or schoolchildren were approved by the Board of Trustees in June 2018.

Similarly, the ICP further manages the Conca Dellà Museum in Isona and the associated museographic space Dinosfera from Coll de Nargó, in the framework of the 'Dinosaurs from the Pyrenees' project and thanks to the funds provided by the Culture Department of the Generalitat de Catalunya. The leading role is performed by the Head of the Mesozoic Faunas Research Group of the ICP (Dr. Àngel Galobart), who by virtue of an agreement with the Conca Dellà city council in 2015 became the Director of the Conca Dellà Museum. The income received in exchange of these services is beneficial for the research performed by the above-mentioned research group and further enables hiring the required personnel.

The various outreach activities performed by the ICP at the Museum in Sabadell, at Isona i Conca Dellà and Coll de Nargó, and in other places will be detailed later in this document.

Preparation and casting services. These services are provided by the Conservation & Preparation Area of the ICP, where a team of well-trained and experienced preparation technicians with the required academic background regularly also perform these tasks for ICP researchers. Casting services are generally provided per request, either for individual amateurs or researchers, or for museums and research institutions; several qualities (and corresponding different prices) are available depending on the aim. Preparation services, in turn, are provided to both research institutions, local administrations and private companies, most often relating to fossils recovered from emergency excavations. Both casting and preparation activities are performed at the well-equipped preparation labs of the Preparation & Conservation Area of the ICP at the ICTA-ICP building within the UAB campus and at the ICP Museum in Sabadell. These services are invoiced on the basis of closed quotes, which are estimated based on the hourly rates and associated costs approved by the Board of Trustees in 2018. The revenues generated contribute to defray the personnel costs of the Conservation & Preparation Area of the ICP, which regularly assist ICP researchers in these tasks. Furthermore, the fossils prepared often remain at the ICP collections, thereby providing new research opportunities for the researchers of the center.

During 2018, the Preparation & Conservation Area of the ICP has prepared 25 fossils in the framework of the provision of services to public and private entities, although it should be taken into account that some of them were of large size (giant tortoise shells, deinotherium cranium) and required long-lasting efforts. They come from the following sites:

- Masquefa.
- Els Casots.
- Ecoparc de Can Mata.

- Torre-Romeu.

Other noteworthy activities performed in 2018 by the Preparation & Conservation Area of the ICP within the framework of service provision include casting and 3D printing of fossil specimens, and the elaboration of supports for exhibiting fossil material.

Paleontological fieldwork services. Fieldwork services provided by the ICP include all of the aspects related to the planning and execution of paleontological interventions, although most frequently they are restricted to rescue (emergency) paleontological interventions that must be defrayed by private companies or the local administration in the framework of construction works in fossiliferous areas, in order to comply with the requirements of current laws about the protection of paleontological heritage. These services include different types of interventions, such as paleontological prospections, samplings, surveillance and excavations, and even conditioning, consolidation and restoration. Some of these services (direction of the intervention, work by technicians, elaboration of the fieldwork memoir, etc.) are invoiced on the basis of hourly rates, whereas other activities (such as screen-washing sediment samples for microvertebrate remains) have associated prices per unit. All of the relevant fees were approved by the Board of Trustees in June 2018.

The following rescue paleontological interventions were performed in 2018 under the direction of the ICP in the framework of the specialized remunerated services provided by the ICP to both private companies and administrations:

- **Abocador de Can Mata:** Prospecion, excavation, control and sampling | Municipality: els Hostalets de Pierola | Age: middle to late Miocene | Directors: J.M. Robles, V. Vinuesa & V. Fondevilla | Company: Cespa Gestión de Residuos/Ferrovial.
- **Pàrquing al costat de Carreras (Turó del Cairot):** Prospecion, excavation, control and sampling | Municipality: Masquefa | Age: middle to late Miocene | Directors: J.M. Robles, E. Mujal & M. Salerno | Company: Ajuntament de Masquefa.
- **Sot del Pi:** Prospecion, control and sampling | Municipality: Terrassa | Age: Middle Pleistocene | Directors: V. Vinuesa | Company: Ajuntament de Masquefa.

The Fieldwork & Collection Management area further performed the following works:

- **Report on fossil sites from Sabadell:** Elaboration of the paleontological portion of the heritage catalog from Sabadell | Company: ATICS.

Virtual paleontology services. Computed three-dimensional techniques have become a generalized tool for the study of fossil remains, being also used in the industry. The 3D Virtual Lab of the Virtual Paleontology Area of the ICP has the required 3D digitalization tools and facilities to provide 3D imaging and other virtual services, including an industrial computed tomography (CT) scan specifically devised for paleontological research, several laser surface-scanners for obtaining surface 3D models of the fossil specimens, and photogrammetry equipment. Coupled with competent ICP staff in all the required techniques and software, the

above-mentioned equipment is positive for the provision of external services to other research institutions as well as the industry (e.g., as related to mechanical pieces). The CT scan is particularly promising in the latter regard, because it is a singular infrastructure that is useful for academic research and industrial applications alike. Unfortunately, the CT scan of the ICP is currently damaged and requires a considerable amount to be fixed, which in 2018 and preceding years significantly hindered the great potential of this area for the provision of external services.

Paleontological and geological consultation services. The technicians from the Fieldwork Management Area of the ICP, in collaboration with ICP researchers, also offer services related to the knowledge on fossil sites and/or paleontological heritage, particularly from Catalonia, as well as to the geology of particular areas. These services generally imply writing some kind of report to convey the required information. Potential clients range from local administrations, to both public entities and private companies, being generally related to the elaboration of environmental impact assessments for the construction industry, the dating of sediments by means of fossils (biostratigraphy), or the elaboration of heritage management plans for city councils. Some of these studies require performing paleontological and/or geological fieldwork, whereas others are exclusively based on the review of the published literature and the archives of the ICP. The fees that apply are based on hourly rates (plus associated costs of maintenance and travel when necessary) that were approved by the Board of Trustees in June 2018. In 2018, these services were provided to the private company Atics, in relation to the elaboration of a list of fossil sites from Sabadell.

In compliance with one of the missions of the ICP, related to the conservation of the paleontological heritage of Catalonia, minor consultation services are also regularly provided for free by the staff of the Fieldwork Management Area as well as ICP researchers to the Archeological and Paleontological Survey of the Generalitat de Catalunya (in relation to fossil sites from Catalonia), and more sporadically also to the Catalan Police (Mossos d'Esquadra) as regards to cases of plundering.

Training

Knowledge transfer activities at the ICP are to a large extent related to academic teaching and supervision, to a large extent (but not exclusively) within the framework of the university.

Scientific courses. From the viewpoint of training, it is noteworthy the ongoing collaboration agreement of the ICP with the private company Transmitting Science (TS), by which scientific courses in the framework of life sciences (with a largely international attendance) are performed at the ICP Museum or in other venues with additional partners. The ICP generally contributes with its facilities, and gets an in-kind return in the form of free courses for ICP researchers and research associates. The current agreement further enables to co-organize other types of courses with a higher involvement of ICP researchers as instructors

(e.g., paleontological fieldwork courses in the framework of ICP excavations), and which might generate pecuniary revenues for the center; we are currently studying the feasibility of this kind initiatives, to be performed in the following years. By means on the ongoing agreement, in 2018 the ICP participated as coorganizer in 17 courses instructed by TS, with a total attendance of 239 alumni. Some of these courses were coorganized exclusively by TS and the ICP, being normally performed at the ICP Museum in Sabadell, whereas others were coorganized at other locations and with additional partners. Overall, these courses were taught by 27 different instructors, mostly foreign.

COURSES COORGANIZED WITH TRANSMITTING SCIENCE (2018)			
COURSE TITLE	VENUE	DATE	ORGANIZERS
Care and Management of Natural History Collections (2 nd ed.)	Capellades	23-27 April	TS, ICP
Introduction to Geometric Morphometrics (10 th ed.)	Capellades	30 April-5 May	TS, ICP
Manipulation of NGS Data for Genomic and Population Genetics Analyses (1 st ed.)	Capellades	14-17 May	TS, ICP
Introduction to R (2 nd ed.)	Sabadell	21-25 May	TS, ICP
Análisis Cuantitativo de la Imagen Avanzado (1 st ed.)	Sabadell	28-31 May	TS, ICP
R without Fear: Applied R for Biologists (4 th ed.)	Sabadell	4-8 June	TS, ICP
Mapping Trait Evolution (2 nd ed.)	Capellades	4-8 June	TS, ICP
Introduction to Bayesian Inference in Practice (1 st ed.)	Capellades	11-15 June	TS, ICP
Integration and Modularity with Geometric Morphometrics (5 th ed.)	Sabadell	19-23 June	TS, ICP
Phylogenetic Analysis Using R (5 th ed.)	Sabadell	3-7 September	TS, ICP
Introduction to agent based-models using Netlogo (5 th ed.)	Capellades	17-21 September	TS, ICP
Técnicas Avanzadas de Microscopía de Fluorescencia y Confocal (2 nd ed.)	UAB	1-4 October	TS, ICP
Using Geiger, Phytools, and other computational tools to study macroevolution on phylogenies (2 nd ed.)	Capellades	1-4 October	TS, ICP
Anatomical Network Analysis (AnNA) (1 st ed.)	Capellades	22-26 October	TS, ICP
Introduction to the Art of Science: Scientific Illustration (2 nd ed.)	Capellades	5-9 November	TS, ICP
Fluid Preservation (1 st ed.)	Capellades	12-16 November	TS, ICP
Introduction to Ecological Niche Modelling (2 nd ed.)	Capellades	19-23 November	TS, ICP

On a less regular basis, the ICP takes a leading role in the organization of other courses (sometimes with other partners), particularly in the field of conservation and preparation of fossils and other objects of both natural and cultural heritage. The following courses were organized by the ICP in 2018:

- “Mètodes de reproducció aplicats al patrimoni cultural”, organized by the Preparation & Conservation Area of the ICP, with the collaboration of Centre de Restauració de Béns Mobles de Catalunya, Escola Superior de Conservació i Restauració de Béns Culturals de Catalunya, and the Museu de Ciències Naturals de Barcelona, and sponsored by Sagristà Products. Bellaterra, 18-22 June 2018.

- “El Permià i el Triàsic als Pirineus. El registre de la major extinció de la Terra”, organized by the ICP within the framework of the courses planned by the Institució Catalana d’Història Natural, in collaboration with the Parc Natural de l’Alt Pirineu. Llavorsí, May 2018.
- “Photogrammetry, or how to take good pictures”, internal course organized by the ICP for its personnel. Cerdanyola del Vallès, 17-18 July 2018.

In 2018 the ICP also collaborated in the following course:

- “Curso de postgrado – Paleoecología”, organized by Consejo Superior de Investigaciones Científicas (CSIC) and Institut de Ciències de la Terra Jaume Almera, in collaboration with Universitat de Barcelona, Instituto Pirenaico de Ecología, Universitat de Girona, Universitat Pompeu Fabra, Centre de Recerca Ecològica i Aplicacions Forestals (CREAF) and the ICP.

University teaching. The ICP is a university research institute of the UAB by virtue of an agreement signed in 2013 and subsequently ratified by the Generalitat de Catalunya in 2014. This agreement was renewed in 2018 and will be valid until 2021. It contemplates the possibility that ICP researchers that are involved in master teaching automatically become teaching collaborators. Punctual agreements have been also established with regard to master teaching with the UB.

In 2018, ICP researchers and technicians participated in the following three different official master degrees:

- **Master in Paleobiology and Fossil Record (UAB/UB):** academic courses 2017–2018 and 2018–2019.
- **Master in Biological Anthropology (UB/UAB):** academic courses 2017–2018 and 2018–2019.
- **Master in Cultural Heritage Management and Museology (UB):** academic course 2017–2018.

It is noteworthy that the Master in Paleobiology and Fossil Record (coorganized by the ICP, the UAB and UB) was resumed in academic year 2017–2018. This master is the successor of the former Master in Paleontology, in which the ICP participated since its start in 2007, until it was temporarily suspended in 2015 to be remodeled. The ICP played a prominent role in the remodeling of the master, and its teaching contribution represents as much as 35% (21/60) of the total ECTS credits (equating 146 teaching hours, the supervision of master theses excluded), by virtue of an agreement signed with the UAB and the UB in 2016. More than twenty ICP researchers and research associates participate as instructors in the master.

It is also noteworthy that the ICP participates in the “Campus d’Arqueologia i Paleontologia de la UAB” by means of the campus location at Coll de Nargó, thanks to the collaboration between the ICP, the Ajuntament de Coll de Nargó and the Departament de Geologia of the UAB. This location, inaugurated in 2017, belongs to the Geoparc Conca de Tremp-Monsec project and perform various research and teaching activities at Dinosfera museographic space and various fossil sites within the framework of the “Dinosaurs of the Pyrenees” project led by

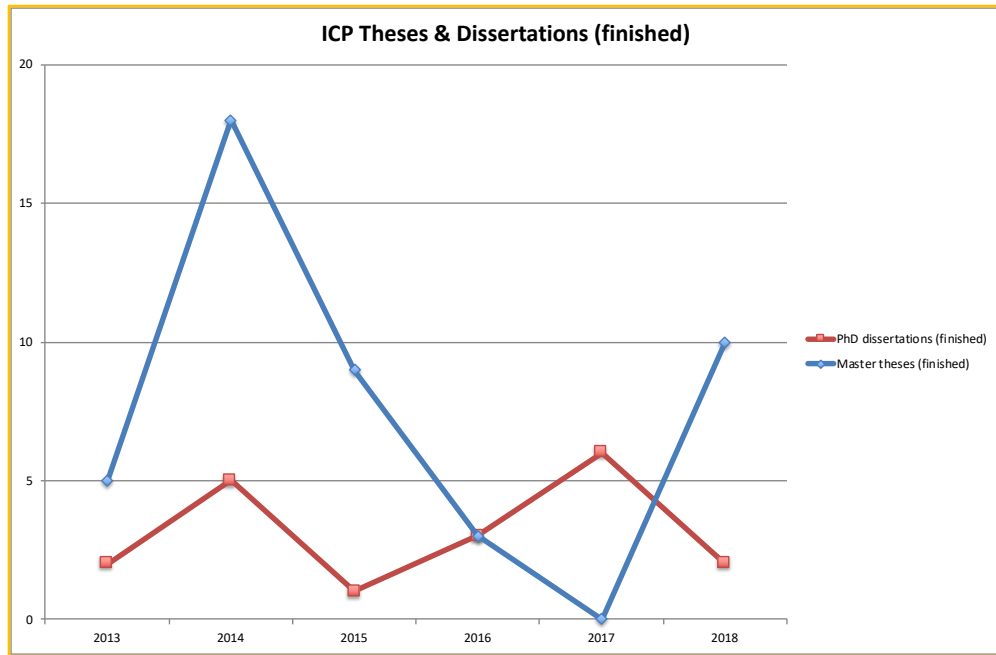
the ICP. The Campus d'Arqueologia i Paleontologia de la UAB was awarded the Jaume Vicens Vives distinction to university teaching quality by the Generalitat de Catalunya in 2018.

Supervision. As in previous years, in 2018 the experienced researchers from the ICP were regularly involved in the training of early career researchers and undergraduate students. In the case of young researchers, training takes the form of supervision of the research performed by either dependent postdoctoral students (e.g., 'Juan de la Cierva' or 'Ramón y Cajal'), PhD candidates, or master students. In turn, the training of undergraduate students is usually accomplished by means of practicums performed by the students at the ICP under the guidance of an ICP researcher/technicians or by through the supervision of bachelor theses. It is noteworthy that practicums are not restricted to research in a strict sense, but are also performed by research support technicians (especially preparators). The Volunteering Program of the ICP is also relevant with regard to training, in the sense that it allows not only university students, but also people outside academia to collaborate not only in research, but also research support and outreach activities performed at the ICP.

The supervisory efforts by ICP researchers can be measured on the basis of the number of finished master theses and PhD dissertations that have been (co)supervised by them. In 2016 and 2017, the number of finished master theses supervised was drastically reduced because the paleontology master in which ICP researchers teach the most had stopped in 2015 and was not resumed until September 2017. As a result, the number of supervised master theses went back to normal 2018 with a total of ten (slightly above the average of the five preceding years). In turn, the number of finished supervised PhD dissertations in 2018 was within normal variation (a total of two, both corresponding to ICP predoctoral researchers), albeit somewhat lower than average and especially much lower than the extraordinarily high figure of six PhD dissertations (co)supervised by ICP researchers and/or research associates in 2017.

During 2018, up to 22 ongoing PhD dissertations were (co)supervised by ICP experienced researchers (S. Moyà-Solà, M. Köhler, À. Galobart, D.M. Alba, I. Casanovas-Vilar, J. Fortuny) and research associates (E. Delson, S. Almécija, M. Delfino, R. Minwer-Barakat, D. DeMiguel, J. Abella, A. Bolet, À.H. Luján, E. Mujal). Seven of these dissertations are being performed by current or former ICP predoc researchers (J. Femenias-Gual, G. Orlandi-Oliveras, T. Calderón, A. Urciuoli, S. Jovells-Vaqué, S. McKenzie, and R. Matamales-Andreu).

SUPERVISED MASTER THESES & DISSERTATIONS (2012–2016 vs. 2017)							
CATEGORY	2013	2014	2015	2016	2017	AVERAGE	2018
PhD dissertations (finished)	2	5	1	3	6	3.4	2
Master theses (finished)	5	18	9	3	0	7.0	10



OUTREACH AND COMMUNICATION

Disseminating to the general public the knowledge hidden in fossils

Website

The ICP website (<http://www.icp.cat>) constitutes an essential tool to disseminate the work performed at the ICP to the general public, with particular emphasis on transmitting the knowledge that derives from the research performed by ICP researchers and research associates, but further including the most significant actions of knowledge transfer as well as scientific dissemination and outreach, among other relevant news.

Website visitors. The annual number of visitors of the ICP website can be monitored based on the data from the web service provider (available since 2009) or those recorded by Google Analytics (data available since September 2015). As already noted in the ICP Annual Report 2017, the marked increase experienced in 2017 by the provided data does not hold upon a close scrutiny, since the high number of visiting IPs from foreign countries such as Russia artifactually reflects the action of Internet bots. The same applies to the data for 2018, which therefore have not been included in the present report, which relies on the more reliable data from Google Analytics (the figure for 2015 has been multiplied by three in the plot below to make it comparable to those for following years). These data indicate that the number of visitors to the ICP webpage in 2018 (ca. 27,400) displayed an increase as compared with the average of the previous three years (2015-2017: ca. 23,700).



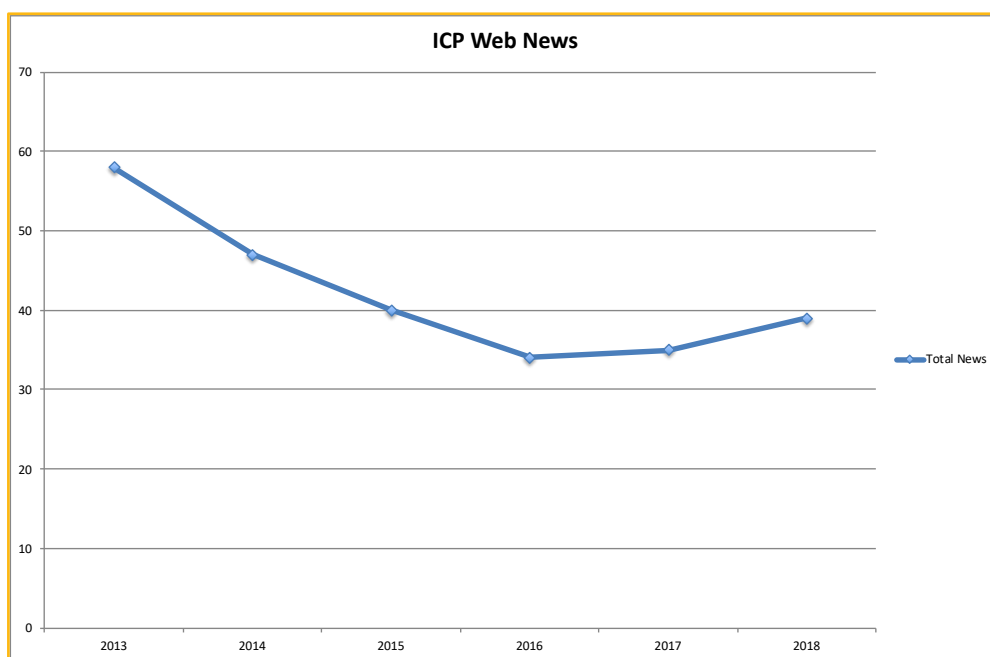
WEBSITE VISITORS (2013–2017 vs. 2018)							
DATA SOURCE	2013	2014	2015	2016	2017	AVERAGE	2018
Website Visitors (Google Analytics)	—	—	20,193	25,036	25,777	23,669	27,376

Web news. The ICP website has a section devoted to paleontological news, which are regularly posted and subsequently disseminated through the ICP social networks. The news posted by the ICP can be divided into four main categories depending on their content:

- **Research:** devoted to ICP publications, fieldwork, stays abroad and visiting researchers.
- **Dissemination and outreach:** related to scientific dissemination, outreach activities, museum exhibits, and other issues related to the ICP Museum.
- **Knowledge transfer:** mostly related to scientific courses and master teaching.
- **Others:** any other news related to the ICP (e.g., inauguration of the new building, appointment of the new director, etc.).

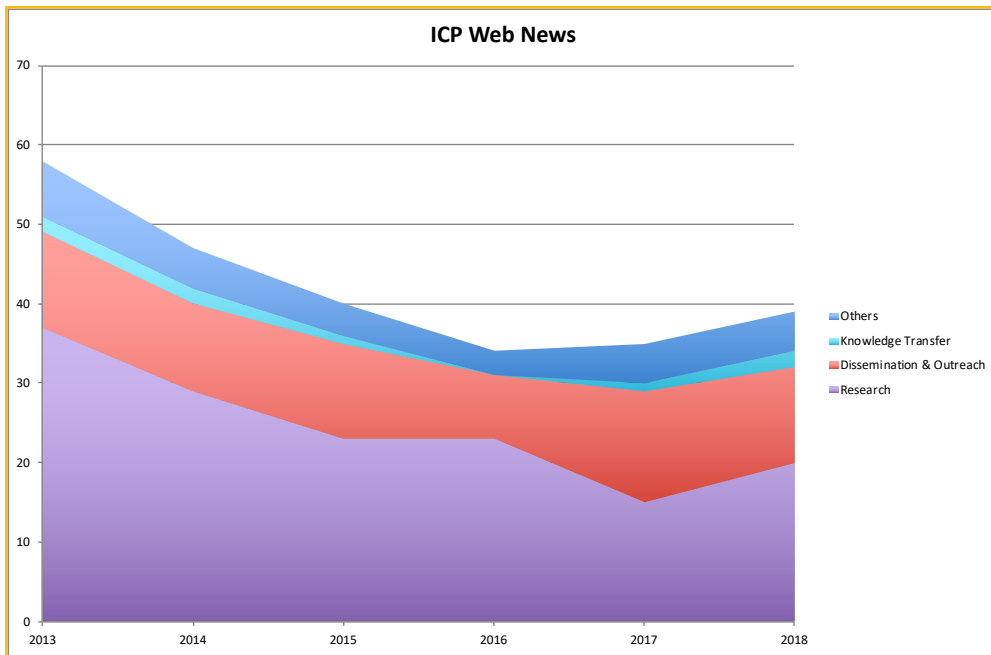
The total number of news posted in 2018 is slightly higher than in 2017 but still below the average for the five preceding years, although it is noteworthy that it starts to reverse the decreasing trend observed from 2013 to 2017. As in all the preceding years except 2017, news devoted to research surpass (even if slightly) the 50% of total news.

WEB NEWS (2013–2017 vs. 2018)							
CATEGORY	2013	2014	2015	2016	2017	AVERAGE	2018
Research	37	29	23	23	15	25.4	20
Dissemination & Outreach	12	11	12	8	14	11.4	12
Knowledge Transfer	2	2	1	0	1	1.2	2
Others	7	5	4	3	5	4.8	5
Total News	58	47	40	34	35	47.8	39

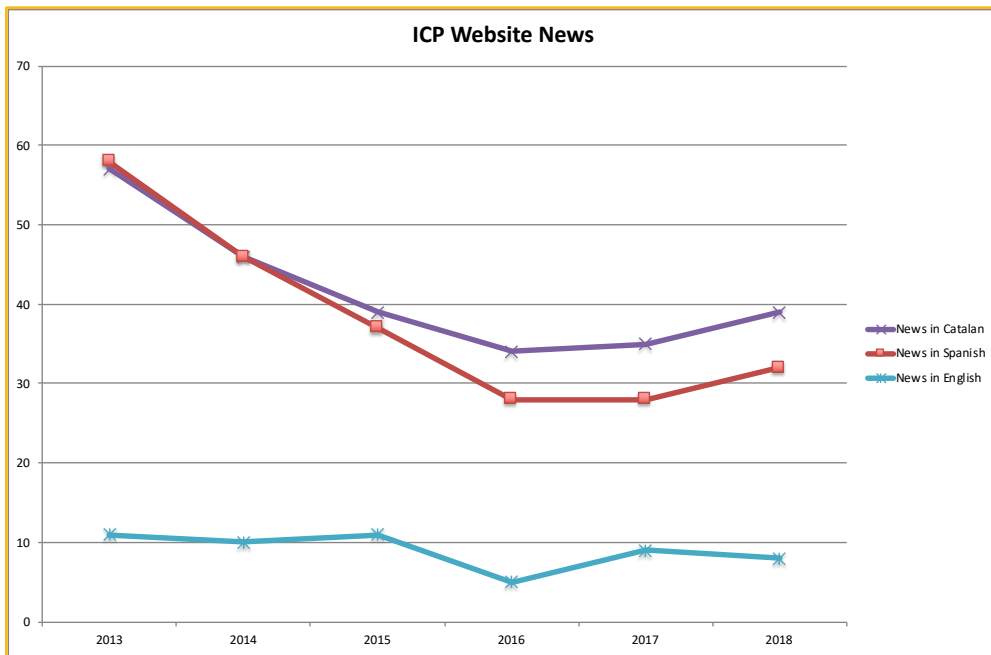


ICP WEB NEWS (2018)			
DATE	TITLE (CATALAN VERSION)	LANGUAGE	CATEGORY
2/1/18	Les faunes invasores van causar l'extinció de l'últim hominoideu europeu del Miocè	CAT ES	Research
30/1/18	Les desconegudes formes de caminar dels goril·les de muntanya	CAT ES	Research
6/2/18	El canvi climàtic de fa 12 milions d'anys a vista de rosegador	CAT ES	Research
13/2/18	Tornen els Cafès Científics a Sabadell!	CAT	Diss. & Outreach
16/2/18	Dia Internacional de la Dona i la Nena en Ciència a Piera	CAT	Diss. & Outreach
28/2/18	Descrita una nova espècie de mamífer insectívor a Castelló	CAT ES	Research
13/3/18	Identificat el primer fòssil de pangolí a la península ibèrica	CAT ES EN	Research
9/4/18	La preparació i conservació de fòssils a la Fira Recerca en Directe	CAT ES	Diss. & Outreach
10/4/18	L'ICP rep el guardó "HR Excellence in Research"	CAT EN	Other
12/4/18	"Vida (i mort) abans dels dinosaures" als Cafès Científics	CAT ES	Diss. & Outreach
23/4/18	Conca de Tremp – Montsec, nou Geoparc Mundial de la UNESCO	CAT ES	Other
23/4/18	Lliurament dels premis "Històries fòssils 2018"	CAT ES	Diss. & Outreach
7/5/18	Curs sobre el Permià i el Triàsic als Pirineus	CAT ES	Knowledge transfer
8/5/18	Una intervenció a Masquefa recupera una cinquantena de fòssils del Miocè	CAT ES	Diss. & Outreach
8/5/18	"En busca del origen perdido", un llibre per apropar la paleontologia al gran públic	CAT ES	Diss. & Outreach
9/5/18	"La especie humana. Los caminos para evitar la extinción", nova obra de divulgació de l'ICP	CAT ES	Diss. & Outreach
18/6/18	Posant llum sobre el desenvolupament de les cries dels dinosaures de bec d'ànec	CAT ES EN	Research
18/6/18	Nova museografia sobre el Triàsic al Museu d'Alcover	CAT ES	Diss. & Outreach
26/6/18	El moment del naixement queda registrat als ossos	CAT ES	Research
26/6/18	L'ICP organitza el primer curs de mètodes de reproducció aplicats al patrimoni cultural	CAT	Knowledge transfer
27/6/18	Un nou programari per reconstruir la dieta d'espècies extintes	CAT ES	Research
29/6/18	L'ICP a l'EAVP 2018	CAT ES	Research
6/7/18	Salvador Moyà rep el premi de la Societat Catalana de Biologia a la trajectòria professional	CAT	Other
16/7/18	L'ICP s'incorpora al Portal de la Recerca de Catalunya	CAT ES	Other
23/8/18	Descobert un rar pterosaure triàsic a Utah	CAT ES EN	Research
30/8/18	El paper dels dits del peu en l'aparició del bipedisme	CAT ES EN	Research
13/9/18	Les restes de mustèlids trobats a la península aclareixen les seves relacions de parentiu	CAT ES	Research
13/9/18	Augmenta el nombre de visitants al Museu de la Conca Dellà i Dinosfera aquest estiu	CAT	Diss. & Outreach
27/9/18	Zebres, cavalls i ases, objecte d'una nova tesi doctoral a l'ICP	CAT ES	Research
2/10/18	Es presenta el volum "Els jaciments de vertebrats del Miocè inferior de Gelida"	CAT ES	Diss. & Outreach
9/10/18	Quan els esquiroles van conquerir el cel	CAT ES EN	Research
18/10/18	L'ICP, el CRIP i el Departament de Cultura signen un conveni de col·laboració per a la gestió del patrimoni paleontològic dels Hostalets de Pierola	CAT ES	Other
5/11/18	Es publica l'estudi més complet del jaciment d'hadrosaures més important d'Europa	CAT ES EN	Research
8/11/18	La Setmana de la Ciència a l'ICP	CAT	Diss. & Outreach
14/11/18	Una nova tesi doctoral a l'ICP sobre l'evolució, taxonomia i paleobiologia de les hienes	CAT ES	Research
21/11/18	L'interior dels fòssils revela les claus del creixement dels cavalls nans del Miocè europeu	CAT ES	Research
3/12/18	Melissiodon, el rosegador més estrany del Vallès-Penedès	CAT ES	Research

7/12/18	D'illa en illa: el viatge de la rata gegant Mikrotia magna	CAT ES EN	Research
17/12/18	La campanya anual d'excavació a la Grotte de la Carrière proporciona prop de 500 noves restes del Pleistocè mitjà	CAT ES	Research



As for the language, as in preceding years Catalan has been the language most frequently used in news posted to the ICP webpage, followed by Spanish and, to a much lesser proportion, English.

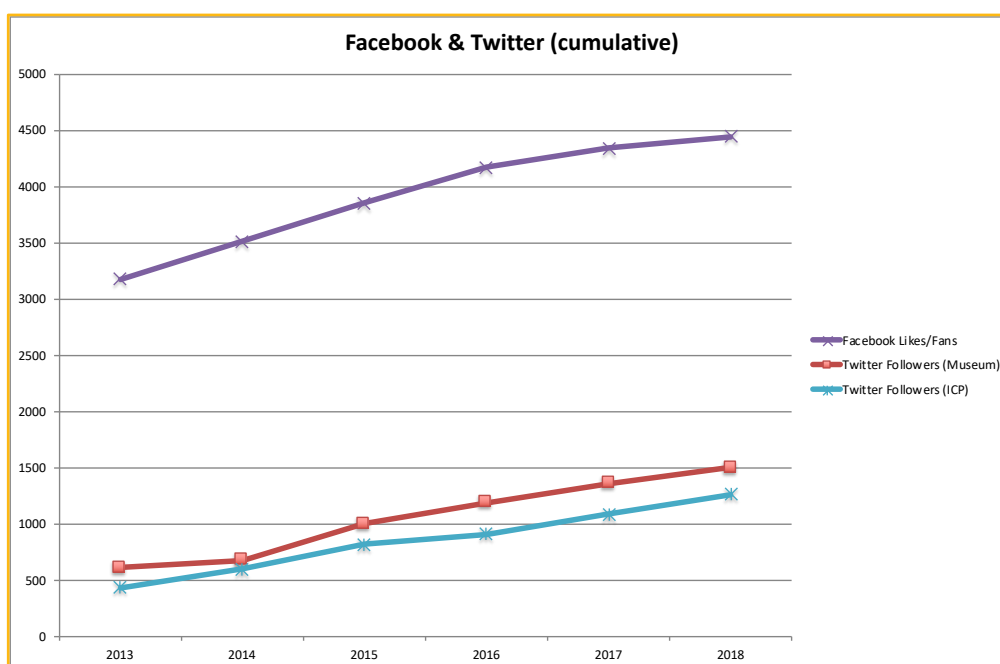


WEB NEWS (2013–2017 vs. 2018)							
CATEGORY	2013	2014	2015	2016	2017	AVERAGE	2018
News in Catalan (CAT)	57	46	39	34	35	47.0	39
News in Spanish (ES)	58	46	37	28	28	45.8	32
News in English (EN)	11	10	11	5	9	13.4	8
News in Catalan (CAT) %	98.3	97.9	97.5	100.0	100.0	98.4	100.0
News in Spanish (ES) %	100.0	97.9	92.5	82.4	80.0	94.5	82.1
News in English (EN) %	19.0	21.3	27.5	14.7	25.7	26.5	20.5

Social networks

The ICP has a Facebook fan page and two Twitter accounts (one for the ICP as a whole, and the other for the ICP Museum), which can be monitored on the basis of ‘fans’ (formerly ‘likes’) and followers, respectively. All these cumulative metrics have progressively increased since 2013 to 2018. The number of new followers of the ICP Twitter is higher than the average of the preceding five years, whereas both the number of new Facebook ‘fans’ and of followers of the Museum Twitter in 2018 are below the corresponding averages for 2013-2017.

SOCIAL NETWORKS (2013–2017 vs. 2018)								
LIKES OR FOLLOWERS	2013	2014	2015	2016	2017	AVERAGE	2018	
Facebook Likes/Fans (new)	389	336	343	314	175	311	99	
Twitter Followers – Museum (new)	246	62	323	189	170	198	144	
Twitter Followers – ICP (new)	133	166	215	92	179	157	175	
Facebook Likes (cumulative)	3175	3511	3854	4168	4343	—	4442	
Twitter Followers – Museum (cumulative)	616	678	1001	1190	1360	—	1504	
Twitter Followers – ICP (cumulative)	437	603	818	910	1089	—	1264	



It is also noteworthy that in late 2017 the Preparation & Conservation Area of the ICP started an Instagram channel to disseminate the work performed by this area, which in 2018 accumulated 248 followers.

Press releases

The Scientific Dissemination and Communication Area of the ICP regularly issues press releases to highlight the most important news related to the ICP, with emphasis on new research outputs, but further including dissemination activities and other noticeable events. A total of 15 press releases were issued by the ICP in 2018 (as compared to 11 in 2017).

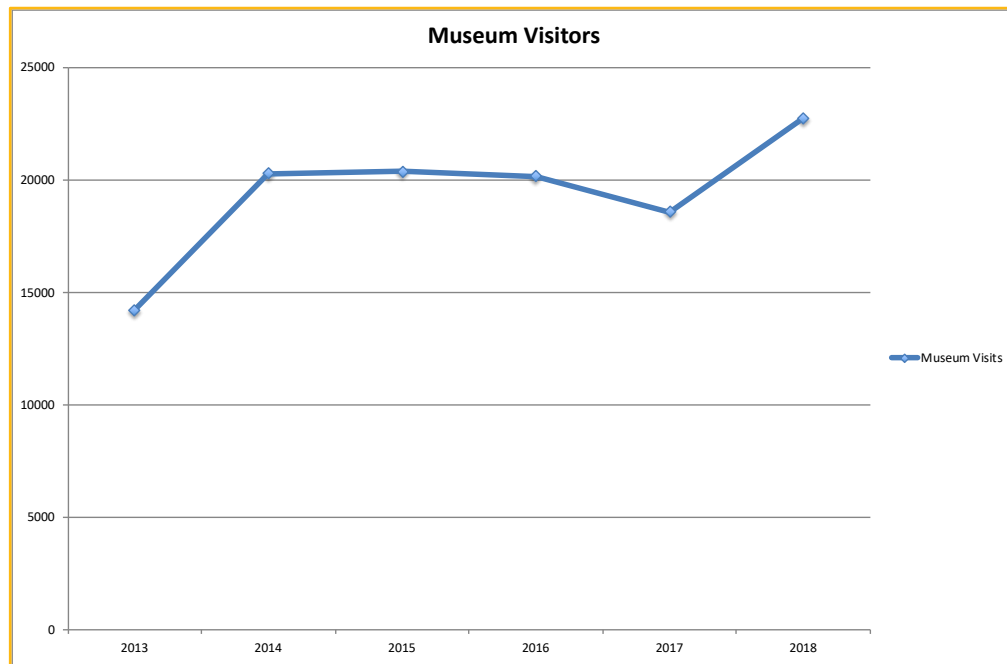
PRESS RELEASES (2018)	
TITLE	DATE
Les faunes invasores van causar l'extinció de l'últim hominoïdeu europeu del Miocè	3 January
Les desconegudes formes de caminar dels goril·les de muntanya	31 January
Identificat el primer fòssil de pangolí a la península ibèrica	21 March
"Vida (i mort) abans dels dinosaures", als Cafès Científics	21 April
"La especie humana. Los caminos para evitar la extinción", nova obra de divulgació de l'ICP	9 May
Posant llum sobre el desenvolupament de les cries dels dinosaures de bec d'ànec	22 May
Nova museografia sobre el Triàsic al Museu d'Alcover	29 May
El moment del naixement queda registrat als ossos	26 June
Descobert un rar pterosaure triàsic a Utah	30 August
El paper dels dits del peu en l'aparició del bipedisme	31 August
Més de 6,000 persones han visitat els espais museogràfics de la xarxa Dinosaures dels Pirineus aquest estiu.	13 September
Les restes de mustèlids trobats a la península aclareixen les seves relacions de parentiu	25 September
Es presenta el volum "Els jaciments de vertebrats del Miocè inferior de Gelida"	2 October
Quan els esquirols van conquerir el cel	9 October
Es publica l'estudi més complet del jaciment d'hadrosaures més important d'Europa	5 November

Museum visitors

The ICP Museum in Sabadell, besides being an indispensable requirement for the research performed at the ICP, is also a very powerful tool from the viewpoint of scientific dissemination and outreach when transmitting paleontological knowledge to a general public. The activity of the ICP Museum can be monitored by means of the number of annual visitors, which include individual visitors and, to a greater extent, organized groups (including schools and families) that attend guided visits and/or various workshops that are organized regularly throughout the year with the aid of external monitors. The museum also offers a wide range of workshops related to paleontology for schoolchildren.

The number of visitors in 2018 was higher than that of any of the preceding five years.

MUSEUM (2013–2017 vs. 2018)							
MUSEUM VISITORS	2013	2014	2015	2016	2017	AVERAGE	2018
Visitors	14,200	20,278	20,376	20,160	18,560	18,715	22,739



Museum activities

The most significant outreach activities of the ICP Museum during 2018 are summarized below. The ICP distributes (without a regular periodicity) a bulletin with ICP Museum activities, which at the end of 2018 had 1,223 subscribers.

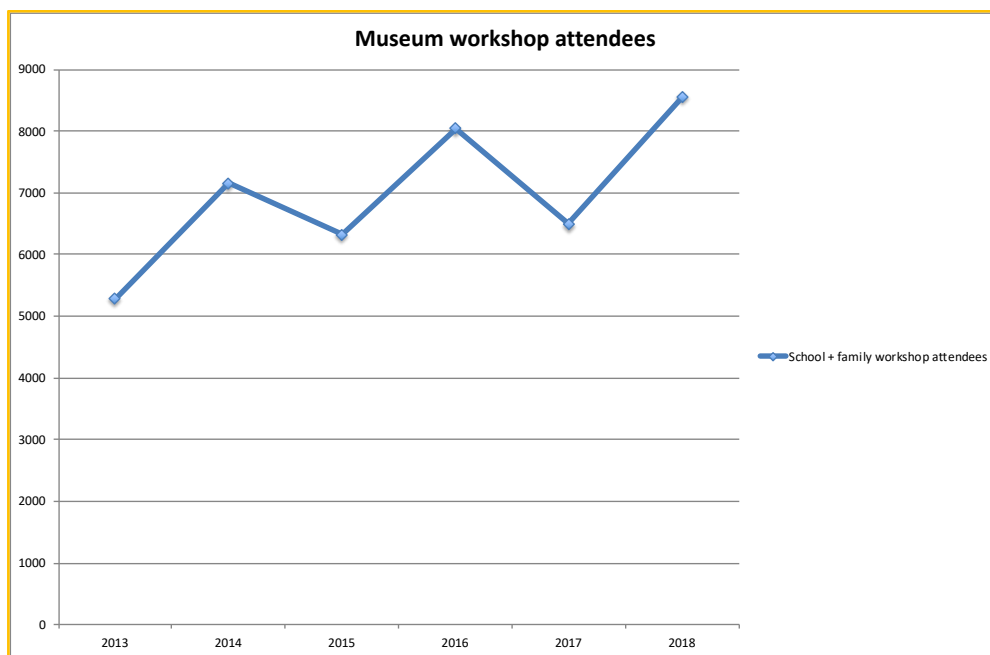
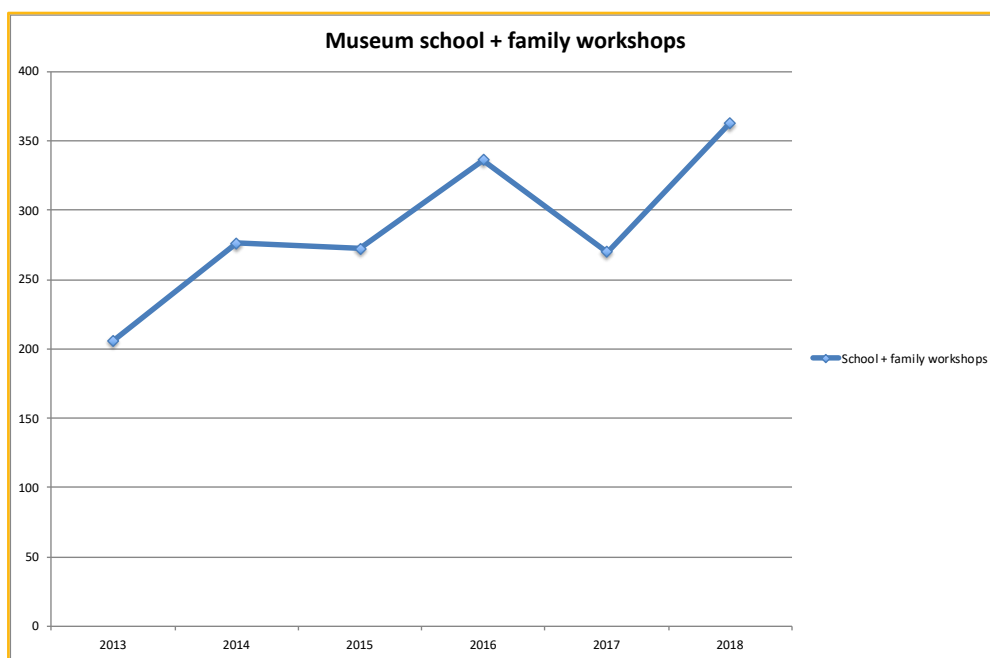
Permanent exhibit. The permanent exhibit, entitled ‘Today you investigate’, is intended to explain to the general public how the various research groups of the ICP perform their research. The exhibit has not been remodeled since 2010, although during the last years it has been enriched with several additional elements and, periodically, also with temporary exhibits.

Temporary exhibits. Throughout 2018, the temporary exhibit “El Triceratops torna a Sabadell”, inaugurated in 2015, has been maintained at the first floor of the exhibit at the ICP Museum. This exhibit pivots around the cast of a *Triceratops* skeleton that was exhibited at the former Institut de Paleontologia M. Crusafont since 1986 until 2009, when the permanent exhibit of the ICP was remodeled. The need to exhibit again this skeleton responded to the requests by many ICP visitors, for which the *Triceratops* had become an icon of paleontology in Sabadell.

Between 8 November 2017 and 15 March 2018, the ICP Museum hosted the temporary exhibit “Dinosaures de Catalunya: un segle de descobertes”, produced by Associació Geoparc Conca de Tremp-Monsec, the ICP and the Museum de la Conca Dellà.

Guided visits and workshops. A total of 12 different workshops are offered to the school community. A total of 326 sessions of these workshops, with 7,761 participant schoolchildren, were performed in 2018, which represents a significant increase as compared to 2017 (245

sessions with 5863 participants). Furthermore, 37 family workshop sessions were performed, with a total of 786 participants (as compared to 25 workshops with 633 participants in 2017). Finally, eleven guided visits were organized in 2018, with up to 257 attending people (compared to eleven visits with 217 attendees in 2017). It is remarkable that the total number of workshops and attendees to these workshops is higher in 2018 than in any of the preceding years.



MUSEUM OUTREACH ACTIVITIES (2013–2017 vs. 2018)							
MUSEUM ACTIVITIES	2013	2014	2015	2016	2017	AVERAGE	2018
School+family workshops	—	276	272	336	270	288.5	363
School+family workshop attendees	5285	7150	6321	8044	6496	6659.2	8547
Guided visits	—	20	13	12	11	14.0	11
Guided visit attendees	338	217	179	255	217	241.2	257

Literary contest. As in previous years, the ICP Museum organized a literary contest entitled “Històries fòssils” and focused on short stories. This year’s edition focused on a titanosaur femur exhibited at the ICP as the main theme. The contest was divided into three different participant categories: 7-10 years old, 11-14 years old, and 15-18 years old. Prizes were awarded in April 2018 just before Sant Jordi.

Open Days. Coinciding with the Week Science (see below) and the annual festivity of Sabadell (10th September) the ICP celebrated several Open Days, with an attendance of 1,454 people. Besides, admittance to the Museum is free the first Sunday of every month.

Science Week. The 23rd edition of the “Setmana de la Ciència”, organized by the Fundació Catalana per a la Recerca i la Innovació, took place between 9 and 18 November 2018. The ICP took part in this initiative, by organizing a guided visit to the ICP Museum in Sabadell on 11 November, another guided visit to the ICTA-ICP building on 13 November, and a family workshop entitled “Fes la teva rèplica d’un fòssil de dinosaure” on 17 November. The visits were guided by the head of the Communication & Outreach Department, and included access to the storerooms and laboratories of the ICP, as well as chats with some of its researchers. Moreover, from 13 to 18 November the admittance to the ICP Museum was free. Up to 200 people attended.

Outreach activities outside the Museum

Presence in the mass media. Until June 2018 continued the monthly collaboration of the ICP Director with Ràdio Sabadell, initiated in October 2017, with the aim to disseminate paleontological knowledge to the general public.

Communication actions related to the publication of the paper “Oldest fossil of a flying squirrel sheds new light on its evolutionary tree” in *eLife* had repercussion in several international (e.g., Science Daily, Eurekalert) and national (La Vanguardia, ABC, CCMA, Cuatro, Agencia SINC, EFE, Europa Press, etc.) mass media. Other scientific publications of the ICP, such as the description of a new pterosaur species from the USA or the first pangolin fossil from the Iberian Peninsula, were also reflected in national mass media.

The documentary “The last giant of Europe” produced by TV3 and the ICP thanks to FECYT funds from MINECO has been available during 2018 at the digital television platform Movistar+.

International Day and Night of Museums. As in previous years, the ICP participated, together with the city council of Sabadell and other museums from the city, in the 8th edition of ‘International Day and Night of Museums in Sabadell’ in 19-20 May. A total of 1,454 people visited the various museums and museographic spaces that coordinate this initiative, which includes activities for family audiences throughout the day as well as cultural proposals for adult audiences during the night. Novelties for 2018 included dramatized visits to Sabadell museums as well as family workshops at Racó del Campanar.

Science Cafés. As in previous years, in 2018 the ICP coorganized with other entities from Sabadell the series of talks entitled “Cafès Científics”. These scientific dissemination talks are intended to promote the contact between the scientific community and the general public, with the ultimate aim to boost the debate about scientific topics among the society. In 2018, ICP researcher Josep Fortuny gave on 17 April a talk entitled “Vida (i mort) abans dels dinosaures” about the end-Permian extinction, with an attendance of 40 people.

Other outreach activities. Other relevant outreach activities performed by the Communication & Outreach Department of the ICP include the following:

- VIII drawing contest of the ICP for children entitled “Quan jo sigui paleontòleg/loga”, with three categories (<5 years, 6-8 years, 9-12 years). The prizes were awarded during the Science Week, and included a guided visit to the Preparation Lab of the ICTA-ICP building with a casting workshop included (20 attendees).
- Activity for third grade of elementary schoolchildren from Escola les Flandes (Piera), performed by female ICP researchers Judit Marigó and Soledad De Esteban-Trivigno (in collaboration with Transmitting Science), during the International Day of Women and Girls in Science on 11 February 2018, with an attendance of 50 girls.
- Participation in Science & Tech Girls Vallès on 17 November 2018, a science and technology dissemination and learning day aimed to 8 to 18-years-old girls, co-organized by Codelearn center and the Ajuntament de Sabadell at Biblioteca Vapor Badia in Sabadell, with an attendance of 25 people.
- Participation of the Preparation & Conservation Area of the ICP in the 16th edition of “Fira de Recerca en Directe” on 11-14 April 2018, organized by Parc Científic de Barcelona and Obra Social “la Caixa” and aimed to disseminate scientific research to the general public (with emphasis on high school students and families), with an attendance of 200 people.
- Participation in YoMo: The Youth Mobile Festival Barcelona (26 February-1 March 2018), with an attendance of 300 people, in the framework of the Mobile World Congress 2018, aimed to boost STREAM (science, technology, research, engineering, arts and mathematics) vocations in youngsters.
- Organization of an excursion to the Ripoll River, in collaboration with the Unió Excursionista de Sabadell, to discover the geology and paleontology of the area. The visit

was guided by ICP technician Manel Llenas, with an attendance of 15 people, on 5 May 2018.

Outreach activities throughout Catalonia

Outreach activities of the ICP are considerably further extended in territorial scope by means of agreements with other museums and interpretation centers. The most significant ones during 2018 are summarized below.

Dinosaurs from the Pyrenees. Since 2015, there is a collaboration agreement between the ICP and the city councils of Isona i Conca Dellà and Coll de Nargó, by virtue of which the ICP assumed a leading role in the management of the Conca Dellà Museum and the associated exhibit Dinosfera in Coll de Nargó. This activity has been developed since then within the framework of 'Dinosaurs of the Pyrenees' project led by the ICP and thanks to the financial support of the Culture Department of the Catalan Government. This project focuses on the research, conservation, study and dissemination of dinosaur fossil remains from the Catalan Pre-Pyrenees (el Berguedà, l'Alt Urgell, el Pallars Jussà and la Noguera), and is directed by Dr. Àngel Galobart, head of the Mesozoic Faunas research group of the ICP and also the Director of the Conca Dellà Museum. Two postdoc researchers of this research group are also involved in the project, and the head of the Outreach & Communication Department of ICP is the responsible to manage the communication of the 'Dinosaurs of the Pyrenees' project (including the website and social networks).

The results of the above-mentioned collaboration, in the framework of the 'Dinosaurs of the Pyrenees' project, are very satisfactory from the viewpoint of increasing the territorial scope of outreach activities performed by the ICP. Such activities are directed to a school and family public, and performed with the participation of local companies and monitors. The number of visitors the Conca Dellà Museum (6,724) and Dinosfera exhibit (7,846) in 2018 (including normal tickets, guided visits, and school visits) increased as compared to 2017 (5,937 and 7,194, respectively). In contrast, the number of participants in other activities organized by the Conca Dellà Museum (3,073) or Dinosfera (273) in 2018 decreased to some extent as compared to the previous year (3,469 and 1,132, respectively).

The main paleontological outreach activities performed in 2018 in the framework of the aforementioned project are reported below:

- Popularizing talks.
- Guided visits to the Covet church.
- Guided visits to the dinosaur neck from Orcau.
- Guided visits to Castell de Lordà.
- Temporary exhibit "Se'n parlave i n'hi havie".
- Dinner at the museum.
- Night at the museum.
- Broadcasting of documentary "El darrer gegant d'Europa".

- Dramatized visits to Sant Climent.

CosmoCaixa (Barcelona). CosmoCaixa from Obra Social “la Caixa” in Barcelona has a number of visitors several orders of magnitude higher than the ICP Museum in Sabadell. Therefore, collaborative agreements with CosmoCaixa not only extend the territorial scope of the ICP, but further amplify to a great extent the outreach capacity that the ICP would have on its own. In 2018 the ICP collaborate with CosmoCaixa by elaborating some panels about Catalan dinosaurs to accompany CosmoCaixa’s temporary exhibit “Trix, the world’s best preserved *Tyrannosaurus rex*”, inaugurated on 28 October 2017 and which lasted until 21 May 2017. Researchers from the Mesozoic Faunas group also helped in the training of the monitors that performed the guided visits to the exhibit.

Palau Moja (Barcelona). On 25 July 2017, a showcase with casts of several emblematic fossils from Catalonia, whose originals are housed at the ICP, was inaugurated in the ‘Heritage Space of Palau Moja’ in Barcelona. The fossils displayed include the skulls of the Miocene apes *Pliobates* and *Pierolapithecus* and the false sabertooth *Albanosmilus*, from Abocador de Can Mata; an archosauromorph footprint, from Olesa de Montserrat; and a titanosaur egg, from Fumanya. Located in a very touristic setting (les Rambles de Barcelona), The Heritage Space of Palau Moja is managed was inaugurated by the Agència Catalana del Patrimoni Cultural (Culture Department, Generalitat de Catalunya) in 2016 with the aim to promote the cultural heritage from Catalonia among the citizens and visitors of the city alike. The casts loaned by the ICP were on display until 18 June 2018.

CRIP (els Hostalets de Pierola). In October 2018, the ICP signed a collaboration agreement with the Culture Department of the Generalitat de Catalunya and the Centre d’Interpretació i Restauración Paleontològica (CRIP) in els Hostalets de Pierola, which aims to promote the recuperation, research and dissemination of the paleontological heritage from this area. Although ICP fossils had already been loaned to the CRIP in previous years to be exhibited there, the signature of this agreement represents the consolidation of previous collaborations as well as the formalization of the will to collaborate further in the same direction.

Museu de l’Art de la Pell (Vic). The 2018 the ICP collaborated by loaning a fossil sirenian cranium in the temporary exhibit “La comarca d’Osona 50 milions d’anys enrere” (28 September 2018-8 January 2019), conceived by geologist Francesc Ferrer and organized by the Universitat de Vic and the Universitat de Barcelona at the Museu de l’Art de la Pell (Vic).

Internal communication

Paleovermutts. In 2018 the Communication & Outreach Dept. of the ICP organized 9 ‘paleovermut’ internal talks. Two were given by invited speakers external to the ICP (I. Labastida and M. Cherin), two by ICP research associates (J. Marcé-Nogué and I.M. Sánchez),

and five by ICP researchers (four by PhD candidates and one by the ICP Director at the end of the year). Further details of these talks are provided in the table below.

PALEOVERMUTS (2018)	
SPEAKER & TITLE	DATE
Ignasi Labastida – Publicar en accés obert. Per convicció o per obligació?	01/02/2018
Alessandro Urciuoli – The basicranium of <i>Pliobates cataloniae</i> . Phylogenetic and morphofunctional implications	21/02/2018
Teresa Calderón – From the present to the past: reconstructing life history of Cervidae under a histological perspective	19/04/2018
Jordi Marcé-Nogué – Computational biomechanics as a key factor to understand diet in vertebrates	17/05/2018
Víctor Vinuesa – The hyaena headache	04/09/2018
Israel M. Sánchez – The enigma of the strange creatures: Evolution of the Giraffomorpha	31/10/2018
Sílvia Jovells-Vaqué – A five year journey: re-discovering the early Miocene of the Vallès-Penedès Basin	22/11/2018
Marco Cherin – Frozen in the ash: New hominin footprints from Laetoli (Tanzania)	12/12/2018
David M. Alba – The Director’s report	19/12/2018

Internal bulletin. The Communication & Outreach Dept. sent two internal bulletins to ICP personnel in 2018, one on 30 July and the other on 2 December.

Digital repositories and platforms for research outputs

The scientific production of the ICP is periodically updated at the ICP website. In particular, the references of SCI papers with the corresponding DOI (digital object identifier, which enables to access the paper on the journal’s website) are listed here: <http://www.icp.cat/index.php/ca/publicacions1/publicacions-sci>. In turn, the whole scientific production for the ICP can be downloaded in PDF format from the following link: http://www.icp.cat/attachments/publicacions/ICP_Publications.pdf.

Accessing the full version of the papers depends on the subscription to the various journals from the network of origin, except for papers published in open access (OA). Publishing in OA is not a measure of research quality per se, but provides higher visibility to the research output and rapidly becoming a common requirement from funding agencies such as the ERC. The ratio of open access SCI papers relative to total SCI papers of the ICP during the last years fluctuates between one-quarter and one-third, thus being comparable to that of the Catalan Research System as a whole (according to the Portal de la Recerca de Catalunya). Needless to say, this represents an important budgetary effort (given the publication fees of many of these journals (particularly the most prestigious ones) and the even more expensive fees of ‘gold open access’ options of subscription journals. The Strategic Plan of the ICP aims to increase the proportion of papers published in OA, but this is hindered by the lack of sufficient research funds that can be devoted to defraying publication fees. An alternative for papers published in subscription journals is to take advantage of the ‘green open access’ options allowed by the

copyright transfer agreements of most journals—by virtue of which preprints or postprints of the articles can be made freely accessible in open access repositories, frequently after an embargo period of several months.

With the aim to make use of green OA possibilities in mind, the Steering Committee of the ICP decided in early 2018 to use the digital repository of the Universitat Autònoma de Barcelona (the Dipòsit Digital de Documents de la UAB, DDD: <https://ddd.uab.cat>) to post the open-access production of the institution, either the original papers (in the case of gold open access) or preprints/postprints (in the case of green open access). The agreement with the UAB was signed on March 2018, and since July 2018 the ICP section on this repository became functional. In particular, the ICP has a section of its own within the DDD repository (<https://ddd.uab.cat/collection/icp>), and the Outreach & Communication Department of the ICP is in charge of implementing the upload of additional documents. This process has already begun by focusing on papers published in SCI open-access journals since 2006, and it will continue based on preprints and postprints of SCI papers published in subscription journals. Finally, it will proceed on the basis of the rest of the ICP production. Given the human resources currently available for this task, the full implementation of this measure will take several years.

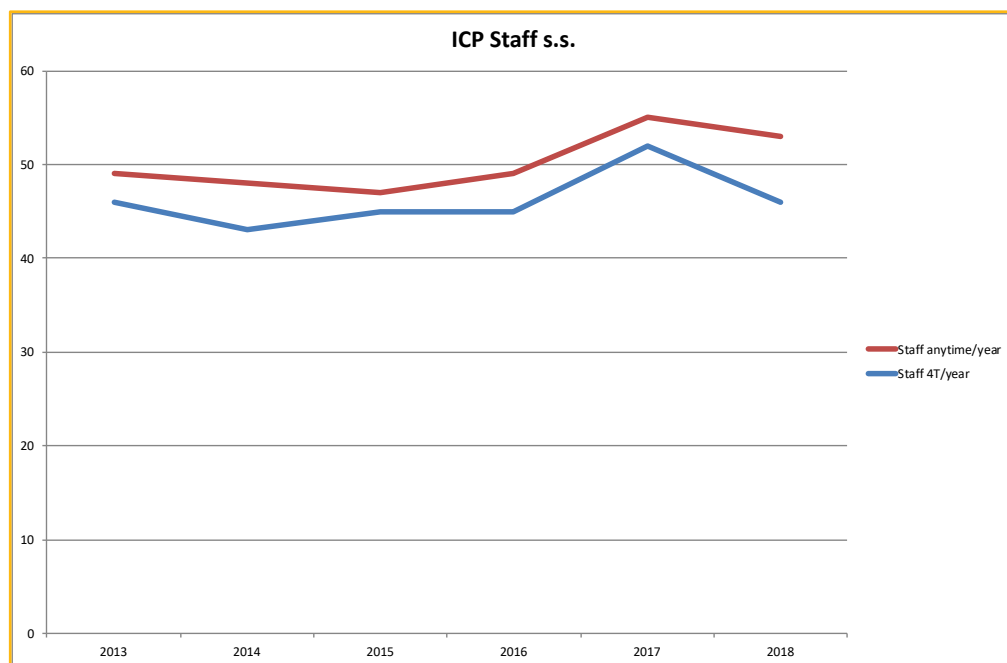
On a related matter, the ICP signed in July 2018 an agreement with the Consorci de Serveis Universitaris de Catalunya (CSUC), which shares academic, scientific, library, knowledge transfer and management services, and is integrated by the Generalitat de Catalunya and ten Catalan universities, including the UAB. Such an agreement regulates the participation of the ICP in the Portal de la Recerca de Catalunya (PRC, <https://portalrecerca.csuc.cat>), which currently hosts the data on the scientific production of Catalan universities, but only that from a few research centers. Including the production of research centers into the PRC is currently considered strategic for the CERCA institution as a whole. By virtue of this agreement, the ICP regularly provides the CSUC with data about its researchers, projects and scientific outputs, since September 2018. This agreement has no cost for the ICP, other than the human resources required to prepare the files with the information to be uploaded to the PRC.

HUMAN RESOURCES

Aiming for excellence in the human resources policies for researchers

Staff personnel

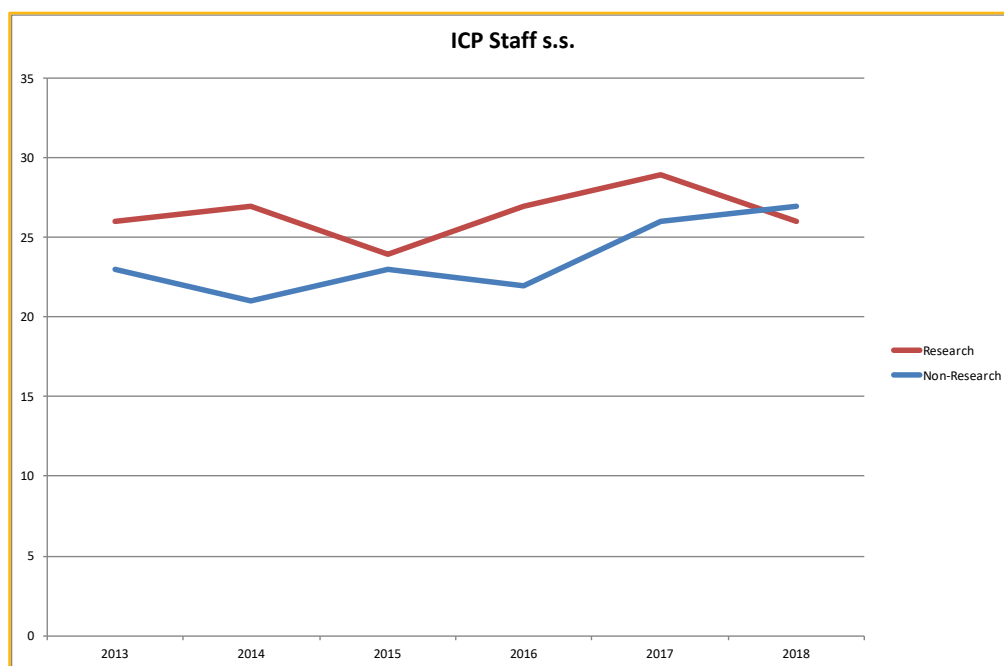
Staff composition. The composition of the staff personnel of the ICP (i.e., people with a contractual relationship with or formally ascribed to the ICP, thereby excluding research associates, collaborators, and people hired occasionally as freelance) is variably through time. In order to compare the ICP staff composition in 2018 with that of previous years, it is possible to rely on total counts per year (irrespective of whether a given person worked the whole year or only a fraction of it) or on a particular year period (such as the fourth quarter, 4T), which arguably provides a more realistic snapshot of the staff composition at any time. The total count per year is higher than the average of the preceding five years but lower than the count for 2017, whereas the count for the fourth quarter of 2018 is similarly lower than the same count for 2017 but very similar to the average of the preceding five years. This discrepancy is due to the fact that the difference between the two counts in 2018 is higher than for any previous year, as a result of short work and service contracts associated to service provision that inflate only the total yearly count. To avoid this kind of distortions it is more advisable to rely on the total payroll for each year.



STAFF (2013–2017 vs. 2018)							
STAFF COMPOSITION	2013	2014	2015	2016	2017	AVERAGE	2018
Total staff members (total year)	49	48	47	49	55	49.6	53
Total staff members (4T)	46	43	45	45	52	46.2	46

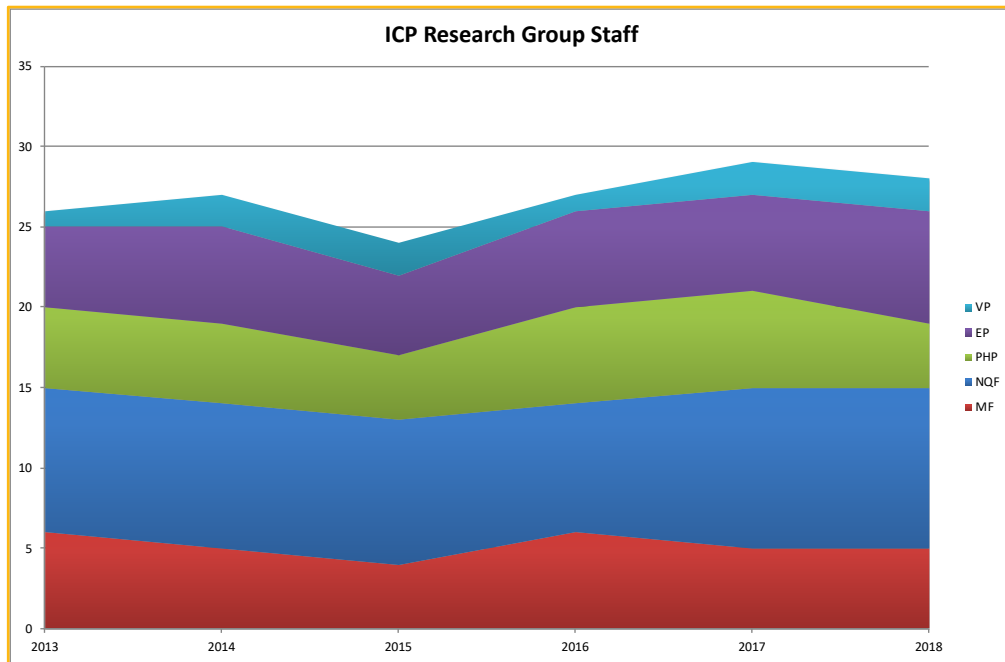
Research staff. Even more relevant than the total number of ICP staff personnel is the proportion between research and non-research staff. With some fluctuations, this proportion has been maintained above 50% during the last years, just to decrease slightly below such a threshold in 2018. However, this is merely attributable to the higher number of short contracts associated to the provision of services. Indeed, the number of research staff in 2018 is very similar to the average for the preceding five years, whereas in contrast the number of non-academic personnel is considerably higher than the corresponding average.

RESEARCH STAFF (2013–2017 vs. 2018)							
STAFF COMPOSITION	2013	2014	2015	2016	2017	AVERAGE	2018
Research staff members	26	27	24	27	29	26.6	26
Non-Research staff members	23	21	23	22	26	23.0	27
% Research/Total	53.1	56.3	51.1	55.1	52.7	53.6	49.1



Research groups. When the composition of research staff is broken down into research groups and the semitechnical area of Virtual Paleontology (associate researchers not included), it can be seen that the composition of the four main groups has remained more or less stable throughout the last years.

RESEARCH GROUPS STAFF (2013–2017 vs. 2018)							
STAFF COMPOSITION	2013	2014	2015	2016	2017	AVERAGE	2018
Mesozoic Faunas (MF)	6	5	4	6	5	5.2	5
Neogene & Quaternary Faunas (NQF)	9	9	9	8	10	9.0	10
Paleoprimatology & Human Paleontology (PHP)	5	5	4	6	6	5.2	4
Evolutionary Paleobiology (EP)	5	6	5	6	6	5.6	7
Virtual Paleontology (VP)	1	2	2	1	2	1.6	2



New Organization Chart. As explained earlier in this document, a new Organization Chart was introduced in late 2017, being immediately publicized to the ICP personnel by means of a specific document that further includes the ICP professional categories. An updated version of this document was publicized in December 2018 (http://www.icp.cat/attachments/transparencia/ICP_Organization_Chart.pdf).

From an organizational viewpoint, the modifications introduced consist in the fusion of the two former Areas of Collections Management and Fieldwork Management into a single Area of Fieldwork & Collections Management, approved by the Steering Committee in November 2018. The former head of the Fieldwork Management Area has assumed the leadership of the new area, whereas the former Fieldwork Official has assumed the interim role of Collections Manager—given the impossibility to recruit someone to fill the vacancy in this position since earlier in 2018.

Continuous training

The ICP has an internal policy of continuous training for its personnel, including not only contracted staff but further including research associates and collaborators. Besides the scientific training provided to early stage researchers (R1 and R2) by their corresponding

supervisors in the framework of the normal development of their research activities, the ICP provides all of its employees with the opportunity to perform free courses each year, in order to foster their continuous training and learning. Some of these courses are intended to all the ICP personnel, whereas other are specifically targeted to researchers (with emphasis on early stage researchers, but extensible to established and even more senior researchers as well).

As in previous years, two main opportunities of continuous training were offered for free to ICP personnel in 2018: courses for employees defrayed with funds available from the Spanish Social Security; and scientificotechnical courses for researchers and research associates, thanks to an agreement with the company Transmitting Science (TS). Unlike in previous years, the former were not restricted to language courses and further included others related to MS Office programs. Those performed by TS, in turn, consist of advanced courses in life sciences (including varied topics, such as statistics and geometric morphometrics, phylogenetic reconstruction, scientific drawing, etc.), being generally held at the ICP premises in Sabadell or else in other nearby locations within the province of Barcelona. Further details about the courses attended by ICP personnel are provided below.

Language and other courses. The courses offered by the ICP to its employees in 2018, and their corresponding attendance, are reported below. These courses were held at the facilities of the ICP at the ICTA-ICP building within the UAB university campus.

- English (advanced level): 2 attendees.
- MicroSoft Excel (basic level): 4 attendees.
- MicroSoft Excel (advanced level): 6 attendees.
- MicroSoft PowerPoint: 2 attendees.

Scientificotechnical courses. The researchers, research associates and technicians of the ICP have the opportunity to attend for free the scientific courses coorganized with Transmitting Science. In 2018, a total of eight ICP employees or research associates attended up to three different courses:

- “Introduction to R”. 21-25 May 2018, Sabadell. 6 ICP attendees.
- “Análisis Cuantitativo de la Imagen Avanzado”. 28 May-1 June 2018, Sabadell. 1 ICP attendee.
- “R without Fear: Applied R for Biologists – 4th edition”. 4-8 June 2018, Sabadell. 1 ICP attendee.

In turn, technicians from the Preparation & Conservation Area attended the following training activities (either free or at least partially defrayed by the ICP):

- “II Curso sobre Técnicas de Preparación Zoológica para Colecciones Científicas”, organized by the Museu de Ciències Naturals de Barcelona. Barcelona, 27 February-2 March 2018.
- “Photogrammetry, or how to take good pictures”, organized by the Institut Català de Paleontologia Miquel Crusafont. Cerdanyola del Vallès, 17-18 July 2018.

- “Curso online: Buenas Prácticas - Manipulación de Bienes Culturales”, organized by Instituto del Patrimonio Cultural de España (IPCE). Madrid, 2 October-9 December 2018
- “VI Trobada de Tècnics de Col·leccions de Ciències Naturals de Catalunya: Els museus de ciències, ciència ciutadana i voluntariat”, organized by the Museu de les Terres de l'Ebre. Amposta, 10 December 2018.

Salary Scale

As a first step toward the implementation of transparent recruitment, a Salary Scale was developed by the Director and the General Manager of the ICP, being approved by the Steering Committee in May 2018 and subsequently by the Board of Trustees in June 2018. This salary scale is based on four professional categories for researchers (R1–R4, corresponding to the four researcher profiles recognized by the European Framework of Research Careers) and three different profiles (T1–T3) for technicians (*sensu lato*, i.e., further including personnel of administration and services). Each position corresponds to one of these professional categories, although certain position can be occupied by multiple categories depending on whether the position is occupied by a senior or a junior researcher/technician. In turn, each professional category entails a given range in the ICP salary scale, although certain positions of higher responsibility further imply a wage supplement (S1–S4).

HRS4R

HR Excellence Award. With the aim to implement the Human Resources Strategy for Researchers (HRS4R) of the European Union, the ICP endorsed the ‘European Charter for Researchers’ and the ‘Code of Conduct for the Recruitment of Researchers’ on December 2016. Soon thereafter, in February 2017, the HRS4R Implementation Committee and Working Group was formally established. This committee was further recognized in the new Organization Chart of the ICP devised by the new Director and approved by the Steering Committee in late 2017 (subsequently ratified by the Board of Patrons in June 2018). This committee has the aim to implement the Human Resources Strategy for Researchers (HRS4R) of the EU at the ICP, and it is mainly composed of non-research staff, since the Researchers Commission further provides advice to the committee from the researchers’ viewpoint. The new Organization Chart further formally recognizes a Management & Human Resources Department, led by the General Manager, with the aim to improve and give internal visibility to the ICP human resources policies within the context of the implementation of HRS4R.

Throughout 2017, the HRS4R Implementation Committee and Working Group, with the aid of the ICP Researchers Commission, performed an internal ‘Gap Analysis’ to evaluate the current degree of implementation of the forty principles included in the Charter and Code and, on this basis, elaborate an Action Plan to implement HRS4R at the ICP. These documents were submitted to the European Commission on November 2017, who formally granted the ‘HR

Excellence in Research' to the ICP on March 2018. In the meantime, the implementation of the Action Plan had already begun, being supervised by the above-mentioned organs of the ICP (see next).

HRS4R Action Plan. The Action Plan devised by the HRS4R Implementation Committee & Working Group (available online from the following URL: http://www.icp.cat/attachments/transparencia/HRS4R_ICP_Action_Plan.pdf) includes 25 specific actions intended to attain a complete implementation of the forty principles included in the Charter & Code.

HRS4R ACTION PLAN			
ACTION No.	DESCRIPTION	EXPECTED	IMPLEMENTATION
Action 1	Upload UAB & CERCA documents to the ICP website	1Q 2018	Partially implemented
Action 2	Update the Strategic Plan	4Q 2018	Fully implemented
Action 3	Manual of Best Practices in Research, Intellectual Property and Scientific Authorship	4Q 2019	Pending
Action 4	Protocol for Invasive and Destructive Analyses of Fossils	1Q 2019	Pending
Action 5	Welcome Handbook	2Q 2019	Pending
Action 6	Protocol for Funding Request	4Q 2018	Delayed
Action 7	Transparency webpage and internal communication	1Q 2018	Under implementation
Action 8	Protocol for Fund Expenditure Accountability	2Q 2018	Delayed
Action 9	Safety & prevention training	4Q 2019	Pending
Action 10	Update the internal Information Systems Security Document	3Q 2019	Pending
Action 11	Improve and translate the Plan of Equal Opportunities and Diversity Management	2Q 2020	Pending
Action 12	Establish a Non-discrimination Committee	1Q 2018	Fully implemented
Action 13	Improve and translate the Guide of Prevention and Action in Case of Gender Violence	4Q 2020	Pending
Action 14	Protocol for the Evaluation, Internal Promotion and Recruitment of Researchers and Technicians	2Q 2018	Under implementation
Action 15	Definition of professional categories	3Q 2018	Fully implemented
Action 16	Strategy for the Professional Development of Researchers	4Q 2019	Pending
Action 17	Publicize positions at an international level	4Q 2018	Delayed
Action 18	Implementation of new organigram with Management & Human Resources Department	2Q 2018	Fully implemented
Action 19	Basic instructions for traveling abroad	3Q 2018	Under implementation
Action 20	Complaints protocol	2Q 2018	Delayed
Action 21	Steering Committee	2Q 2018	Fully implemented
Action 22	Coordination Meetings	1Q 2018	Fully implemented
Action 23	Researchers Commission	1Q 2018	Fully implemented
Action 24	Organization of talks ('Paleovermut's initiative')	1Q 2018	Fully implemented
Action 25	Free language courses and other types of training	1Q 2018	Fully implemented

Although the implementation of the HRS4R Action Plan already began in late 2017 with the approval of the new Organization Chart, most of the Action Plan initiatives were planned for 2018–2019. The implementation process is overseen by the HRS4R Implementation

Committee & Working Group, and further supervised by the Steering Committee, with the aid of other committees and commissions of the ICP (particularly, the Researchers Commission). The implementation of the 25 actions of the HRS4R Action Plan at the end of 2018 are summarized in the following table. Out of 17 actions planned for 2018, 9 are fully implemented, 4 are partially implemented or under implementation, and 4 are delayed. The remaining 8 actions are pending (6 planned for 2019 and 2 for 2020).

The HRS4R actions that became fully implemented in 2018 are explained in greater detail below:

- **Action 2: Update the Strategic Plan.** Description: To update the ICP Strategic Plan (2010–2013) available from the ICP website, stating among others the aims and scope of the various ICP research groups. It is intended as a management tool that seeks to identify the current situation of the institution, including its risks and opportunities, as well as to define its main strategic aims, in order to guarantee on the midterm the successful accomplishment of its mission with regard to paleontological research, knowledge transfer, and conservation of the paleontological heritage of Catalonia. Responsible Unit: Director. Indicator(s)/Target(s): Updated document available from the ICP website and emailed to personnel, and approved by the Board of Trustees. Implementation: Originally planned for the fourth quarter of 2018, the new Strategic Plan (2018-2021) written by the Director was already approved by the Steering Committee and publicized among ICP researchers in February 2018.
- **Action 12: Establish a Non-discrimination Committee.** Description: To transform the Equality Plan Committee that redacted the original plan into a Non-discrimination Committee that intends to further improve it and looks after its correct application. Responsible Unit: Steering Committee. Indicator(s)/Target(s): Minute of the Steering Committee meeting approving the creation of the Non-Discrimination Committee. Implementation: Originally planned for the first quarter of 2018, in fact it was already implemented in December 2017 by means of the approval of the new Organization Chart by the Steering Committee.
- **Action 15: Definition of professional categories.** Description: To define the ICP professional categories and evaluate current ICP salaries in relation to those in other CERCA research institutions. Responsible Unit: Steering Committee and Management & Human Resources Department. Indicator(s)/Target(s): Internal document draft elaborated by the Steering Committee with the help of the Management & Human Resources Department, to be subsequently incorporated in the “ICP Strategy for the Professional Development of Researchers” document. Implementation: Originally planned for the third quarter of 2018; but already available since the definition of ICP positions in the new Organization Chart publicized in December 2017, together with the subsequent approval by the Steering Committee (and subsequently the Board of Trustees) in June 2018 of the ICP Salary Scale, which further includes a definition of ICP categories of researchers and non-academic staff.

- **Action 18: Implementation of new organigram with Management & Human Resources Department.** Description: To modify the ICP Organigram, in order to create a Department of Management and Human Resources that officially recognizes the role of the General Manager as the Head of Human Resources, as well as to further implement the “ICP Strategy for the Professional Development of Researchers”. Responsible Unit: Director. Indicator(s)/Target(s): Document with new organigram approved by the Steering Committee, available from the ICP website, emailed to personnel, and approved by the Board of Trustees. Implementation: Originally planned for the second quarter of 2018, it was already enforced in December 2017, and subsequently ratified by the Board of Trustees in June 2018.
- **Action 21: Steering Committee.** Description: To implement the recent changes in the ICP organigram, which includes the recently created Steering Committee (including the Director, General Manager, and Heads of Department), with mandatory meetings of a predeterminate periodicity, in order to more actively participate in consultation and decision-making. Responsible Unit: Director. Indicator(s)/Target(s): Document with new organigram approved by the Steering Committee, available from the ICP website, emailed to personnel, and approved by the Board of Trustees; minutes of the Steering Committee meetings (at least monthly). Implementation: Originally planned for the second quarter of 2018, the Steering Committee was established by the new Director in October 2017, and subsequently institutionalized in December 2017 with the approval of the new Organization Chart of the ICP, subsequently ratified in June 2018 by the Board of Trustees.
- **Action 22: Coordination Meetings.** Description: To establish the periodicity of Coordination Meetings, in order to facilitate the periodical exchange of ideas between Heads of technical and managerial Areas and the members of the Steering Committee of the ICP. Responsible Unit: Director. Indicator(s)/Target(s): Minute of the Steering Committee meeting in which periodicity of coordination meetings is established; minutes of the coordination meetings (at least quarterly). Implementation: Originally planned for the first quarter of 2018, their periodicity was already established in October 2017, and with more or less regularity these meetings have taken place ever since.
- **Action 23: Researchers Commission.** Description: To maintain the currently-established Researchers Commission, including at least a representative of the four researchers levels recognized by the EU, beyond the implementation of the HRS4R Action Plan, to provide advice the ICP Steering Committee in matters relevant to researchers. Responsible Unit: Steering Committee. Indicator(s)/Target(s): Minute of the Steering Committee meeting in which periodicity of coordination meetings is established; minutes of the Researchers Commission meetings (at least quarterly). Implementation: Originally planned for the first quarter of 2018, it is fully implemented since December 2017, when the Steering Committee approved the new Organization Chart (see above).

- **Action 24: Organization of talks ('Paleovermut's initiative').** Description: To make it mandatory for PhD candidates at the ICP to report at least once a year the progress of their research to other ICP researchers by means of talks in the framework of the ICP Paleovermut's initiative (public talks organized for the ICP, in which personnel from or visiting the institution perform a talk followed by informal discussion accompanied by snacks and beverages) (principle 36). Responsible Unit: Communication & Scientific Dissemination Area (Outreach & Communication Department). Indicator(s)/Target(s): Posters announcing the paleovermut (monthly). Implementation: Originally planned for the first quarter of 2018, it was fully implemented in 2018, when eight paleovermut talks were organized.
- **Action 25: Free language courses and other types of training.** Description: To extend the type of courses currently offered for free to ICP personnel, including their extension, the covered topics (other than language courses), and the types of courses (including e-learning). Responsible Unit: Projects Area (Research Support & External Services Department). Indicator(s)/Target(s): Internal records of the courses offered to and performed by the ICP personnel; progressive increase on the mid term. Implementation: As planned, the implementation of this measure started during first quarter of 2018, by means of exploring the types of courses, other than language training, that can be offered to ICP employees by taking advantage of the budget available from social security contributions of the ICP. This budget, even if somewhat restricted, enables to provide free courses to ICP employees (instructed by specialized companies) at almost no cost for the center. During the second quarter of 2018, both language courses (English) and office automation software courses (MS Excel and Powerpoint) were attended by ICP personnel.

Recruitment protocol and internal evaluation

Recruitment protocol draft. An OTM-R (open, transparent and merit-based recruitment) policy is a key element in HRS4R strategy, and therefore the ICP is fully committed toward its implementation. As specified in the HRS4R Action Plan and the Strategic Plan (2018-2021) of the ICP, the toolkit of the "Open, Transparent and Merit-based Recruitment of Researchers" (OTM-R) Package of the European Union was used as a guide to elaborate a "Protocol for the Evaluation, Internal Promotion and Recruitment of Researchers and Technicians", to be publicized on the ICP website and among ICP researchers, technicians, and potential candidates to ICP job announcements as soon as it is ready.

The ICP recruitment protocol will not only regulate the principles that must rule the recruitment of researchers by the ICP, but also the career progression of ICP researchers (i.e., internal promotion). As noted by the OTM-R Package, to get the best possible person for a given job, recruitment must be open, transparent and merit-based, thereby ensuring that both internal and external candidates have equal opportunities to occupy a new or a vacant

position. Obviously, as further noted by the OTM-R Package, internal promotion cannot be open, but it must be also transparent and merit-based. Therefore, both recruitment and internal promotion at the ICP will be made on the basis of similar evaluation procedures and selection criteria, even if with minor differences because internal promotion must be restricted to ICP candidates.

The main guidelines of the ICP recruitment protocol were already elaborated in 2017, whereas a first draft of the whole text was written by the ICP Director, with input from the Steering Committee, the Non-Discrimination Committee, and the Researchers Commission during 2018. A final version of the recruitment protocol is expected to be approved by the Steering Committee during the first quarter of 2019, to be subsequently submitted for ratification or eventual amendment to the Board of Trustees.

Based on the 2018 draft, the recruitment protocol will include specific guidelines for the following steps:

- (1) Approval of the position (job offer) by the Steering Committee.
- (2) Nomination of an ad hoc Selection Committee by the Steering Committee.
- (3) Drafting of the job announcement by the Selection Committee.
- (4) Review and approval of the job announcement by the Non-Discrimination and Steering Committees.
- (5) Advertising of the job announcement by the Outreach & Communication Dept.
- (6) Elaboration of a candidates' shortlist by the Selection Committee.
- (7) Further evaluation of the applications by the Selection Committee and external reviewers.
- (8) Selection of the best candidate by the Selection Committee, communication of the results to the shortlisted candidates, and appointment by the Management & Human Resources Dept.

As currently drafted, the protocol will include the following selection criteria for researchers:

- (a) Research outputs.
- (b) International visibility & mobility.
- (c) Fundraising abilities.
- (d) Supervision, mentoring & teaching.
- (e) Other academic activities.
- (f) Paleontological fieldwork experience.
- (g) Management & leadership capabilities.
- (h) Outreach & knowledge transfer.
- (i) Other merits.
- (j) Suitability of the candidate's profile and potential.

The list of possible merits to be considered among each of these criteria will depend on the type of position and professional category. Besides general guidelines applicable to all job

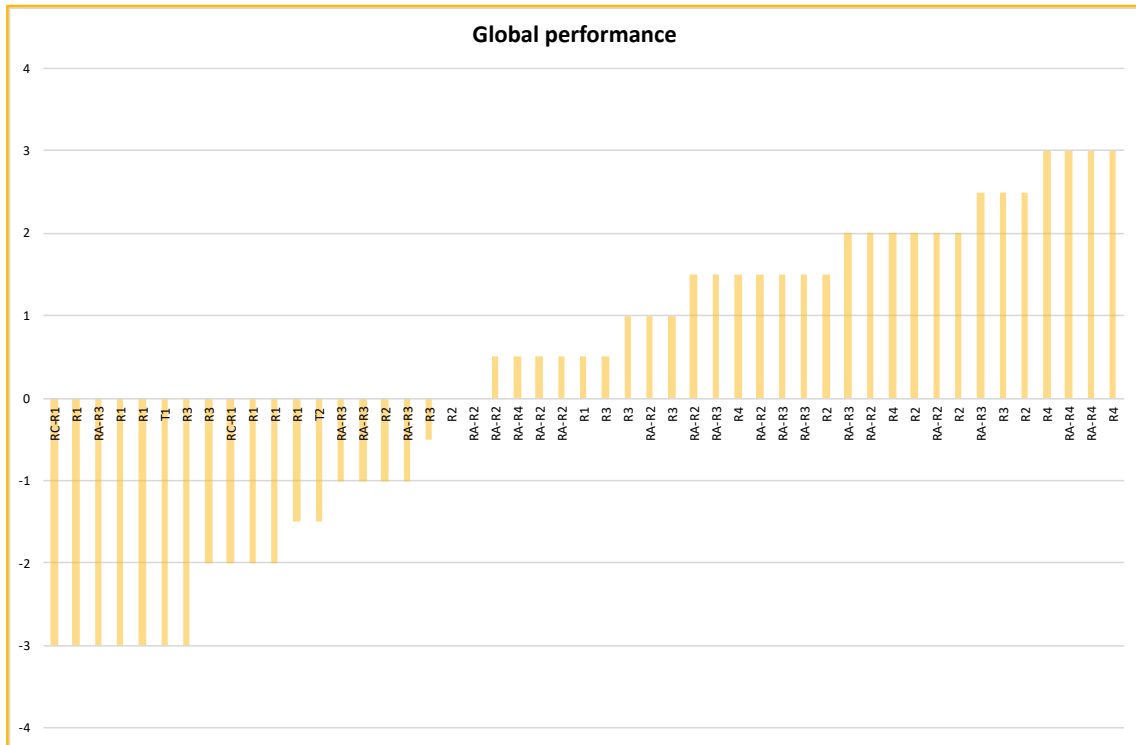
announcements regarding the selection criteria and their relative significance for each type of position, the ad hoc Selection Committees will be able to modulate the merits to be included and their relative significance (before publicizing the job offer).

Internal evaluation of researchers. Also included in the recruitment protocol draft is a series of metrics aimed for the internal evaluation of researchers. In particular, three different ad hoc metrics are distinguished based on the SCI production of each ICP author (thereby including researchers, research associates, and some technicians that also coauthor papers). The following metrics are distinguished:

- **Global impact:** it is based on the SCI production of a given researcher, by simultaneously reflecting quality, impact, visibility and leadership; although it is mostly based on JIF, other variables (quartile, category, open access, and number, position and role of authors) are considered.
- **Relative contribution:** also based on SCI production, it measures the relative contribution of each researcher to the overall ICP production in terms of publications (particularly from the first quartile, in open-access and multidisciplinary journals, and led by ICP authors).
- **Relative impact:** measures the relative quality/impact of a researcher's output as compared to that of the ICP irrespective of production volume.

Computations are restricted to the last five years, and the two first variables are standardized by career duration (which also takes into account career breaks) as specified in the recruitment protocol. For each variable, a rating is assigned to each researcher depending on the relative ranking as compared to ICP authors as a whole, based on the median and interquartile range (worse than average = -1; slightly below average = 0; slightly above average = +0.5; and better than average = +1). The overall performance metric of an individual researcher will be computed as the sum of the three ratings (from -3 to +3) and will determine the result of the evaluation: negative (lower than -1.5), neutral (between -1.5 and 0), positive (between +0.5 and +1.5), very good (between +2 and +2.5), and excellent (+3.0). Only researchers with a positive evaluation will be considered eligible in internal recruitment processes.

Pending the approval of the recruitment protocol by the Board of Trustees in 2019, and the publication of JCR for 2018 later in 2019, the evaluation results for ICP researchers in 2018 can be summarized as follows (see also plot below): 11 negative, 9 neutral, 16 positive, 9 very good, and 4 excellent.



STRATEGIC MANAGEMENT

Implementing the 2018-2021 Strategic Plan for 2018–2021

Viability Plan

ICP had in 2017 a deficit of 46 k€, which added to that accumulated from previous years yields a total deficit of 91 k€. In May 2018, the Steering Committee approved a Viability Plan (subsequently ratified by the Board of Trustees) with several actions aimed to correct this situation of budgetary deficit as well as to guarantee the economical viability of the institution (by reducing the ICP structural expenses and also increasing the incomes).

Short-term measures to reduce expenses. The total payroll of the ICP is by far the most important portion of the budget, so the Viability Plan focused on this aspect rather to maintenance expenses or those related to reject projects and service provision, which are most difficult to reduce. The measures included in the Viability Plan and implemented in 2018 included: (1) facilitating voluntary leaves; (2) linking voluntary leaves of researchers with research associate agreements; (3) dismissing workers that do not perform adequately; (4) postpone until 2019 salary increases linked to the new Salary Scale; (5) promote the application of competitive contracts by ICP researchers and technicians; and (6) restrict hiring to short work and service contracts and do not replace vacant positions until an OTM-R protocol is available.

Mid-term measures to increase income. The income of the ICP includes the basal budget, competitive funds, and service provision revenues. The former depends on the Generalitat de Catalunya, while competitive fundraising can be only significantly increased by means of European projects, so that focusing on service provision is the main strategy to improve the budgetary situation of the ICP. The restructuring of the organization chart implemented since late 2017 was particularly aim to boost more marked-oriented policies by means of promoting service provision.

Predictions and results for 2018. The viability plan predicted a reduction in structural salaries from 675 k€ in 2017 to 586 k€ in 2018 (with a reduction in the total payroll from 1019 k€ to 951 k€) and an increase in service provision from 111 k€ in 2017 to 136 k€ in 2018. All else being equal, that would imply a surplus of 47 k€ in 2018, leading to a reduction in the accumulated deficit down to 44 k€.

The results for 2018 indicate a reduction of the totay payroll from 1019 k€ to 945 k€ (i.e., a reduction slightly higher than anticipated) and an increase in service provision from 111 k€ to 202 k€ (i.e., a much higher increase than predicted in the Viability Plan). However, associated

costs to service provision and other expenses have resulted in a more modest surplus than expected (22 k€ as compared to 47 k€), which nevertheless has enabled to reduce the accumulated deficit from 91 k€ to 69 k€.

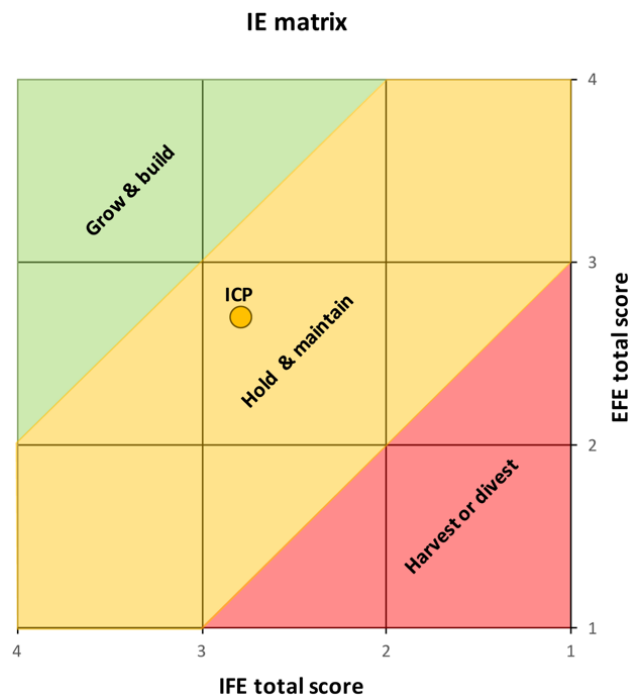
No significant reduction in the structural payroll is expected for 2019, and indeed the total payroll will likely increase due to the incorporation of new researchers with competitive contracts that have some cofunding associated. In contrast, a more significant increase in service provision is expected, which allows us to be confident about the prospect of attain similar positive results in 2019. This would imply a reduction of the accumulated deficit in about 3-4 years. In the meantime, efforts should be put on project applications to European funding agencies (which, thanks to the overheads, would enable to reduce the accumulated deficit more quickly) as well as on establishing a proactive patronage policy based on donors and sponsors (which coupled with service provision and European competitive funds would enable the ICP to more definitively solve its budgetary deficiencies on the long term).

Strategic Plan

SWOT analysis. A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the ICP was performed by the Director in late 2017 in the framework of the elaboration of a new Strategic Plan (2018-2021), which was publicized in February 2018 and subsequently ratified by the Board of Trustees in June 2018. (http://www.icp.cat/attachments/transparencia/Strategic_plan_2018_2021.pdf). A summary of the SWOT analysis was already provided in the Annual Report 2017 and the full version is included in the Strategic Plan, so that only the main results are repeated below before providing a more detailed summary of the Strategic Plan.

The SWOT analysis enabled the identification of 70 factors (35 internal and 35 external), of which 44 were positive and 26 negative (also summarized in the table below): 23 strengths (S1–S23); 12 weaknesses (W1–W12); 21 opportunities (O1–O21); and 14 threats (T1–T14). These factors were subjected to internal factor evaluation (IFE) and external factor evaluation (EFE) analyses, in which the significance of each factor was evaluated both quantitatively (by assigning a ‘weight’) and qualitatively (by assigning a score or ‘rating’) to each factor. The IFE and EFE results were then combined in an internal-external (IE) matrix divided into three different regions with different strategical implications in terms of a research center’s performance: (1) Grow and build (excellent and very strong research center that must take advantage of favorable opportunities to grow); (2) Hold and maintain (the research center is doing well, and can take advantage of some current opportunities); (3) Harvest or divest (the research center is not performing well and must be reorganized, downsized, merged with another center). The IFE value calculated for the ICP (2.8) is higher than 2.5 and therefore indicate that the center is relatively strong relative to its competitors. Similarly, the computed EFE value (2.7) is higher than 2.5, which indicates that the ICP is ready to take advantage of at least some opportunities as well as to defend against threats. When combined into the IE matrix, the ICP falls in a very central position of the matrix, which clearly indicates that the

suitable overall strategy is ‘hold and maintain’, even though the IFE and EFE total scores are slightly above average and hence slightly closer to the ‘grow and build’ than to the ‘harvest or divest’ strategies. Overall, these results indicate that the ICP is generally performing well, being a solid institution that is making good use of available opportunities, although there is room for improvement; and even though strengths are more important than weaknesses, the institution is not powerful enough to plan growing further on the midterm. Instead, efforts should focus on maintaining the most important current ‘assets’ of the ICP, by trying to take advantage of some opportunities but leaving others unexplored due to excessive risk or lack of resources.



Strategic goals. The Strategic Plan for 2018–2021, elaborated on the basis of the SWOT analysis, is conceived as a management tool that seeks to identify the current situation of the institution, including its risks and opportunities, as well as to define its main strategic aims, in order to guarantee the successful accomplishment of its mission on the midterm with regard to paleontological research, knowledge transfer, and conservation of the paleontological heritage of Catalonia.

In particular, based on the results of the IE matrix indicating that a ‘hold and maintain’ strategy is advised, the Strategic Plan defines 19 strategic goals are defined within four strategic areas (based on a combination between internal and external factors outlined above):

- Scientific Policy & Research (SPR): 7 strategic goals.
- Management & Human Resources (MHR): 5 strategic goals.
- Fundraising & Knowledge Transfer (FKT): 5 strategic goals.
- Outreach & Communication (OC): 2 strategic goals.

Four different types of strategies were taken into account when defining strategic goals:

- Strength-Opportunity (SO) strategies, which use strengths to maximize opportunities, in order to improve further the current situation: 10 strategic goals.
- Weakness-Opportunity (WO) strategies, which minimize weaknesses by taking advantage of opportunities, in order to maintain the current situation: 3 strategic goals.
- Strength-Threat (ST) strategies, which use strengths to minimize threats, in order to prevent a deterioration of the current situation: 2 strategic goals.
- Weakness-Threat (WT) strategies, which minimize weaknesses and avoid threats, in order to prevent further a deterioration of the current situation: 4 strategic goals.

The 19 strategic goals defined by the Strategic Plan are the following:

- **Scientific Policy & Research (SPR):**
 - ✓ **SO1:** Consolidate the excellent scientific production and productivity of the ICP.
 - ✓ **SO2:** Consolidate the high quality and impact of the ICP scientific production.
 - ✓ **WO1:** Increase the excellent visibility of the scientific production of the ICP by promoting publication in open-access papers.
 - ✓ **WO2:** Improve research support provided to ICP researchers by the Virtual Paleontology Area.
 - ✓ **ST1:** Preserve the high competitiveness and foster the fidelity of ICP researchers by means of maintaining the excellent research support provided to them.
 - ✓ **ST2:** Provide to researchers specific guidelines of ethics in publishing, with emphasis on intellectual property rights and authorship issues.
 - ✓ **WT1:** Foster talent retention and attraction to secure the continuity of the successful ICP research lines.
- **Management & Human Resources (MHR):**
 - ✓ **SO3:** Increase the critical mass of ICP staff researchers by fostering talent attraction, with emphasis on the recruitment of foreign researchers.
 - ✓ **SO4:** Increase talent attraction at early career stages.
 - ✓ **SO5:** Improve the internal cohesion and coordination and promote staff involvement in decision-making at the ICP by implementing the new Organization Chart.
 - ✓ **WT2:** Improve the salaries and general working conditions of ICP staff (including HRS4R implementation) in spite of financial risks and budgetary constraints.
 - ✓ **WT3:** Improve the effectiveness and internationalization of researchers' recruitment by developing and implementing OTM-R policies.
- **Fundraising & Knowledge Transfer (FKT):**
 - ✓ **SO6:** Increase the ICP operating budget by means of the provision of external services.
 - ✓ **SO7:** Increase the ICP operating budget by means of competitive calls or research projects and grants, with emphasis on ERC grants and the application of modern techniques to paleontological research.
 - ✓ **SO8:** Foster knowledge transfer also in relation to training.

- ✓ **WO3:** Increase the ICP operating budget by means of competitive calls for dissemination and outreach activities.
- ✓ **WT4:** Avoid budgetary deficit at the ICP and increase the ratio of competitive + private income relative to the total budget.
- **Outreach & Communication (OC):**
 - ✓ **SO9:** Promote further the dissemination of the research performed by ICP researchers by means of digital media.
 - ✓ **SO10:** Promote further the outreach activities performed by the ICP.

Slightly more than half of these strategic goals are intended to use ICP strengths to maximize its opportunities and hence improve the current situation (SO, 53%). The rest of the strategic goals consist in minimizing weaknesses by taking advantage of opportunities to maintain the current situation (WO, 16%), or in minimizing weaknesses (WT, 21.1%) and using strengths (ST, 10.5%) to avoid/minimize threats and therefore prevent a deterioration of the current situation. In summary, half of the strategic aims are intended to preserve the current situation of the ICP, whereas the other half are aimed to improve it further. This seems appropriate given the overall strategy indicated by the SWOT analysis, namely 'hold and maintain', albeit closer to 'grow & build' than to 'harvest or divest'.

In the Strategic Plan, the aforementioned strategic goals are ranked based on the sum of the weighted scores of the internal and external factors included in each of them, and then these values are converted into percentages relative to the total summatory, to evaluate the potential impact of each goal. The strategic goals with the highest potential impact are those based on SO strategies, beginning with SO7 (11%: 'Increase the ICP operating budget by means of competitive calls or research projects and grants, with emphasis on ERC grants and the application of modern techniques to paleontological research'). When the potential impact of each strategic area is considered, it emerges that the strategic plan puts a greater emphasis on FKT (33.8%, 5 goals), followed by SPR (28.4%, 7 goals), MHR (25.5%, 5 goals), and OC (12.4%, 2 goals). Therefore, the Strategic Plan adequately covers the four designated strategic areas, with emphasis on Fundraising & Knowledge Transfer—especially, in incrementing the operating budget by means of competitive funding and service provision (based on SO strategies).

Strategic actions. In turn, for each strategic goal, several strategic actions are defined, resulting in a total of 38 strategic actions (see table below). The potential impact of each goal was distributed among the contained actions based on a total of 84 indicators, which were rated (1 to 4) according to their perceived importance regarding the corresponding action. The average rating for each action within a goal was converted into a percentage of perceived importance, which served to distribute the goal's potential impact among the included actions. The importance ratings, the perceived importance (%), and the potential impact (%) for the 38 strategic actions have been reported in table format in the following pages. A similar

ICP STRATEGIC GOALS & ACTIONS (2018–2021)	IMPORTANCE RATING	PERCEIVED IMPORTANCE%	POTENTIAL IMPACT %
SO1 [SPR] — Consolidate the excellent scientific production and productivity of the ICP:			6.70
A1. Encourage ICP researchers to publish more papers in SCI journals	4.00	49.38	3.31
A2. Recruit new research associates, with emphasis on R3 and R4 categories	2.50	30.86	2.07
A3. Promote further international collaborations	1.60	19.75	1.32
SO2 [SPR] — Consolidate the high quality and impact of the ICP scientific production:			5.90
A4. Encourage ICP researchers to prioritize publication in SCI journals from the first quartile	3.67	40.89	2.41
A5. Encourage ICP researchers to target more often SCI journals from the multidisciplinary category	2.80	31.23	1.84
A6. Encourage ICP researchers to favor journals with high impact factors and/or impact factor percentiles	2.50	27.88	1.65
WO1 [SPR] — Increase the excellent visibility of the scientific production of the ICP by promoting publication in open-access papers:			1.89
A7. Encourage ICP researchers to publish in SCI open-access journals	1.50	100.00	1.89
WO2 [SPR] — Improve research support provided to ICP researchers by the Virtual Paleontology Area:			1.82
A8. Elaboration of a viability plan for the CT and subsequent repair	3.50	100.00	1.82
ST1 [SPR] — Preserve the high competitiveness and foster the fidelity of ICP researchers by means of maintaining the excellent research support provided to them:			6.54
A9. Maintain or increase the number of research support staff	3.00	100.00	6.54
ST2 [SPR] — Provide to researchers specific guidelines of ethics in publishing, with emphasis on intellectual property rights and authorship issues:			3.1
A10. Elaborate a manual of best practices in research, in relation to intellectual property and authorship.	2.80	100.00	3.09
WT1 [SPR] — Foster talent retention and attraction to secure the continuity of the successful ICP research lines:			2.40
A11. Encourage R3-R4 talented ICP researchers to stay at the ICP	3.00	66.67	1.60
A12. Correct the disequilibria between NQF and the remaining research groups.	1.50	33.33	0.80
SO3 [MHR] — Increase the critical mass of ICP staff researchers by fostering talent attraction, with emphasis on the recruitment of foreign researchers:			8.44
A13. Maintain or increase the critical mass of ICP researchers	4.00	47.06	3.97
A14. Increase the number of foreign ICP staff researchers, both in absolute and relative terms	2.50	29.41	2.48
A15. Encourage former R1 and R2 researchers to come back to the ICP after a postdoctoral phase abroad	2.00	23.53	1.99
SO4 [MHR] — Increase talent attraction at early career stages:			7.93
A16. Increase the number of R1 and R2 researchers at the ICP	2.00	30.77	2.44
A17. Increase the number of master students supervised by ICP researchers	2.00	30.77	2.44
A18. Increase the number of PhD candidates supervised by ICP researchers	2.50	38.46	3.05
SO5 [MHR] — Improve the internal cohesion and coordination and promote staff involvement in decision-making at the ICP by implementing the new Organization Chart:			4.05

A19. Organize a meeting of the Steering Committee almost every month	4.00	50.00	2.03
A20. Regularly organize meetings of the various ICP advisory organs	2.00	25.00	1.01
A21. Organize coordination meetings of quarterly periodicity	2.00	25.00	1.01
WT2 [MHR] — Improve the salaries and general working conditions of ICP staff (including HRS4R implementation) in spite of financial risks and budgetary constraints:			2.67
A22. Improve the ICP salaries of non-competitive staff to the level before the budget cuts during the crisis	3.00	37.50	1.00
A23. Implementation of excellence in human resources for researchers according to the ICP HRS4R Action Plan	3.00	37.50	1.00
A24. Elaborate a strategy for the professional development of researchers.	2.00	25.00	0.67
WT3 [MHR] — Improve the effectiveness and internationalization of researchers' recruitment by developing and implementing OTM-R policies:			2.39
A25. Elaborate a protocol for the evaluation, internal promotion and recruitment of researchers	3.00	100.00	2.39
SO6 [FKT] — Increase the ICP operating budget by means of the provision of external services:			7.57
A26. Promote the provision of external services by the Research Support & External Services Department	3.50	100.00	7.57
SO7 [FKT] — Increase the ICP operating budget by means of competitive calls or research projects and grants, with emphasis on ERC grants and the application of modern techniques to paleontological research:			10.90
A27. Promote fundraising by means of competitive projects and grants achieved by the research groups	4.00	26.67	2.91
A28. Increase the competitive income from Catalan and Spanish research projects	3.50	23.33	2.54
A29. Obtain significant European funding (e.g., ERC grant)	4.00	26.67	2.91
A30. Consolidate competitive funding for predoctoral grants as well as postdoctoral and tenure-track contracts	3.50	23.33	2.54
SO8 [FKT] — Foster knowledge transfer also in relation to training:			7.14
A31. Maintain and further promote university training by means of teaching in university masters and courses	2.00	100.00	7.14
WO3 [FKT] — Increase the ICP operating budget by means of competitive calls for dissemination and outreach activities:			5.13
A32. Promote the achievement of competitive funding for scientific dissemination and outreach	2.50	100.00	5.13
WT4 [FKT] — Avoid budgetary deficit at the ICP and increase the ratio of competitive + private income relative to the total budget:			3.05
A33. Increase the ratio between competitive funds s.l. (competitive + external services) and total operating budget above 50%	3.50	100.00	3.05
SO9 [OC] — Promote further the dissemination of the research performed by ICP researchers by means of digital media:			9.10
A34. Promote the visibility of the ICP website	2.17	61.90	5.63
A35. Promote the visibility of the ICP on social networks	1.33	38.10	3.47
SO10 [OC] — Promote further the outreach activities performed by the ICP:			3.28
A36. Attract a higher number of visitors to the ICP Museum in Sabadell	3.00	37.50	1.23
A37. Elaborate a remodelation plan for the permanent exhibit of the ICP Museum in Sabadell	2.00	25.00	0.82
A38. Increase the territorial scope of the ICP outreach activities	3.00	37.50	1.23
		TOTAL	100

procedure was followed to compute the potential impact of the various indicators (not reported here; see the Strategic Plan document for further details). These indicators will be useful to evaluate the degree of accomplishment of the present Strategic Plan for 2018–2021 in the future. All of the indicators are binary, in the sense that each one includes a criterion (or condition) that may be fulfilled (1) or not (0). The summatory of these values multiplied by their respective potential impact percentages will yield the degree of achievement of the strategic plan (from 0% to 100%).

Comparison with other paleontological institutions

In the framework of the CERCA evaluation of the ICP in 2018, the Director elaborated a report for the Evaluation Committee based on the “Evaluation Questionnaire” provided by CERCA. This report included the comparison with three top worldwide paleontological institutions in terms of scientific production and productivity. The three institutions selected by the ICP Steering Committee were the following:

- Palaeobiology Research Group (PRG), School of Earth Sciences, University of Bristol (UK).
- University of California – Museum of Paleontology (UCMP), Berkeley, USA.
- Centre de Recherche sur la Paléobiodiversité et les Paléoenvironnements (CR2P), CNRS-MNHN-Sorbonne Université, France.

In the CERCA Evaluation Questionnaire elaborated in 2018, the comparison of the ICP with the above-mentioned institutions was circumscribed for the five preceding years (2013-2017). Here we provide an updated version of these results based on the scientific production and productivity for year 2018.

Methods. Most of the comparisons have been performed on the basis of production in SCI (Science Citation Index) journals (i.e., those indexed by the Journal Citation Reports), in part because they constitute the major bulk of peer-reviewed articles published by all these institutions (including the ICP), and also because bibliometric indicators of impact and quality are restricted to those journals indexed by the JCR.

To compare the ICP with the three institutions mentioned above, we relied on several metrics based on SCI publications compiled for the last five years with the aid of the respective websites, Scopus and WOS. They are summarized in the tables below:

The various metrics employed were intended to measure production, authors, productivity, quality and impact, open access, leadership, field of research, multidisciplinary, and (international) collaborations. Some of these metrics are considered absolute indicators, in the sense that they are not scaled relative to the size of each institution; others, in contrast, are considered relative indicators (ratios, percentages, mean values, etc.), because they are independent from the size of each institution.

ABSOLUTE INDICATORS	DEFINITION
SCI papers	Number of papers in SCI journals (co)authored by authors from each institution in a given year
SCI authors	Number of authors from each institution that have coauthored at least a paper in a SCI journal in a given year
SCI Q1	Number of papers in SCI journals from the first quartile (co)authored by authors from each institution in a given year
SCI open access	Number of papers in SCI open-access journals (co)authored by authors from each institution in a given year
SCI leadership	Number of papers in SCI journals with a corresponding authors from each institution in a given year
SCI Q1 leadership	Number of papers in SCI journals from the first quartile with a corresponding authors from each institution in a given year
Paleontology	Number of papers in SCI journals from the JCR category 'Paleontology' (co)authored by authors from each institution in a given year
Multidisciplinary sciences	Number of papers in SCI journals from the JCR category 'Multidisciplinary sciences' (co)authored by authors from each institution in a given year
SCI own papers only	Number of papers in SCI journals (co)authored exclusively by authors from each institution in a given year
SCI papers int. coll.	Number of papers in SCI journals (co)authored by authors from each institution and authors from at least one institution from another country in a given year
Total collaborations	Number of affiliations included in papers from SCI journals (co)authored by authors from each institution in a given year (each affiliation counts once per paper)
International collaborations	Number of affiliations from other countries included in papers from SCI journals (co)authored by authors from each institution in a given year (each affiliation counts once per paper)

RELATIVE INDICATORS	DEFINITION
SCI productivity	SCI papers / SCI authors
SCI Q1 productivity	SCI Q1 / SCI authors
SCI Q1 ratio %	SCI Q1 / SCI papers x 100
SCI open ratio %	SCI open access / SCI papers x 100
SCI leadership ratio %	SCI leadership / SCI papers x 100
SCI Q1 leadership ratio %	SCI Q1 leadership / SCI papers x 100
SCI median JIF percentile	Median of journal impact factor percentile for all the SCI papers (co)authored by authors from each institution in a given year
SCI IF GM	Geometric mean of impact factor for all the SCI papers (co)authored by authors from each institution in a given year
%Paleontology	Paleontology / SCI papers x 100
%Multidisciplinary sciences	Multidisciplinary sciences / SCI papers x 100
SCI own papers only (%)	SCI own papers only / SCI papers x 100
SCI papers int. coll. (%)	SCI papers int. coll. / SCI papers x 100
International collaborations (%)	International collaborations / Total collaborations x 100

Comparative sample of paleontological research institutions. The three main research institutions selected for comparison with the ICP are briefly described below:

- Palaeobiology Research Group (PRG), School of Earth Sciences, University of Bristol (UK):**
 As advertised in their own webpage (<http://palaeo.gly.bris.ac.uk/>), it is considered the “best paleontology research group in the world”—although in this regard it must be stressed that this concept of ‘research group’ is different from that of the ICP, so that the different ‘laboratories’ of Bristol’s PRG are comparable to the ICP ‘research groups’, being named after the group leader (the Benton laboratory, the Donoghue laboratory, etc.), but similarly with clear aims and scope. The PRG is clearly larger than the ICP, as shown among others by the fact that it has a total of seven ‘laboratories’ (as compared to the four ICP research groups). The members of the PRG are affiliated to the School of Earth Sciences of the University of Bristol, and therefore the scientific production of the group is difficult to

retrieve on this basis, although it can be compiled based on the information provided on its website.

- University of California – Museum of Paleontology (UCMP), Berkeley, USA:** This institution is more similar to the ICP in the sense that it consists of a museum with research staff (although the ICP is rather a research center with a museum). Like the PRG, this institution is organized into different ‘labs’ (up to eight), which are roughly equivalent to the ICP research groups. The fact that its affiliation is not recognized as distinct from the University of California in Scopus (unlike in the case of the ICP) hinders retrieving their SCI productivity, although this can be done with the help of the publication list reported on its website (<http://www.ucmp.berkeley.edu/>).
- Centre de Recherche sur la Paléobiodiversité et les Paléoenvironnements (CR2P), CNRS-MNHN-Sorbonne Université, France:** This research center, exclusively devoted to paleontology (in a broad sense), aims at elucidating the phylogenetic patterns and evolutionary history of living organisms through the fossil record and environments of the past. It is simultaneously supported by the Muséum National d’Histoire Naturelle (MNHN), Paris; the Centre National de la Recherche Scientifique (CNRS); and formerly the Université Pierre-et-Marie Curie (UPMC-Paris 6), which since January 2018 was merged into the current Sorbonne Université. As indicated in its webpage (<http://paleo.mnhn.fr/en>), the CR2P equals to the Unité Mixte de Recherche (UMR) 7207. Both identifiers have been most useful to retrieve its scientific production from Scopus and similar databases. The CR2P resembles the ICP in involving the cooperation of a university, a museum, and a research national institution. It has three ‘research teams’, which are much larger than the ICP research groups: Team 1 (PACE: Palaeoecosystems: analysis, comprehension, evolution); Team 2 (PDM: Metazoan phylogeny and diversification); and Team 3 (2F: Forms and functions).

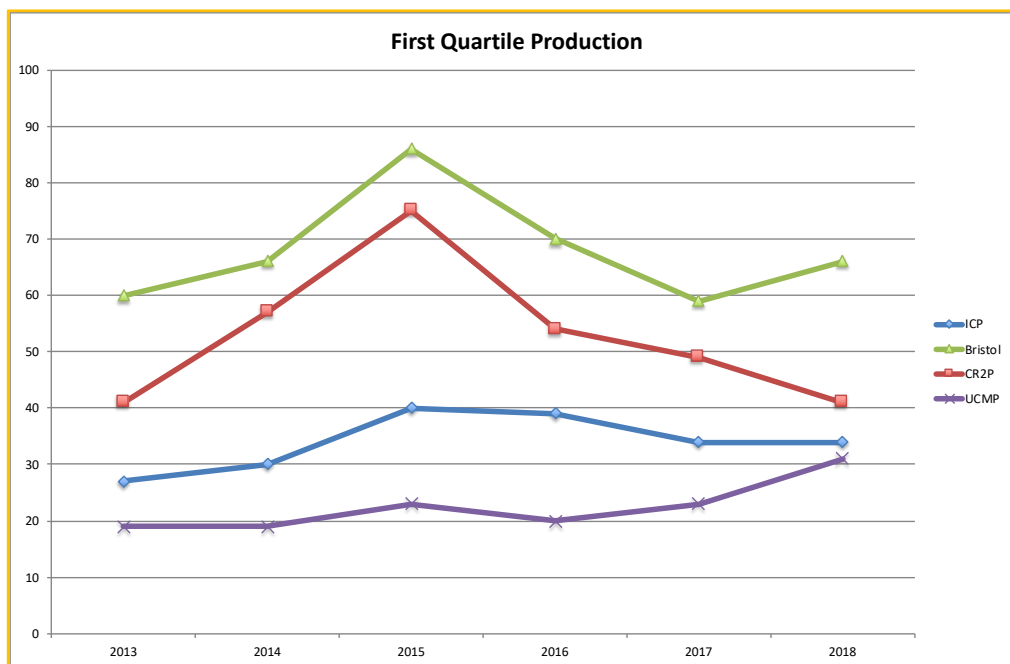
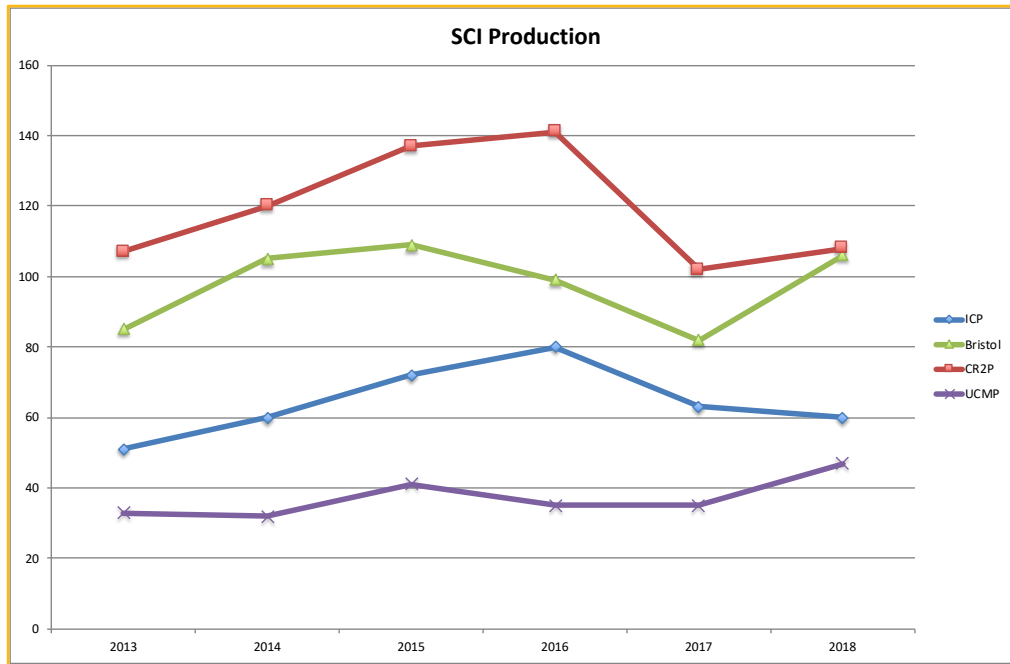
Absolute and relative indicators. The annual values for the aforementioned indicators during 2018, the preceding five years (2013-2017) and the average for the latter are reported in the following table. Relative indicators are denoted in italics.

INSTITUTION	METRIC	2013	2014	2015	2016	2017	2013-2017	2018
ICP	SCI papers	51	60	72	80	63	65.2	60
PRG	SCI papers	85	105	109	99	82	96.0	106
CR2P	SCI papers	107	120	137	141	102	121.4	108
UCMP	SCI papers	33	32	41	35	35	35.2	47
ICP	SCI Q1	27	30	40	39	34	34.0	34
PRG	SCI Q1	60	66	86	70	59	68.2	66
CR2P	SCI Q1	41	57	75	54	49	55.2	41
UCMP	SCI Q1	19	19	23	20	23	20.8	31
ICP	SCI authors	39	40	49	44	37	41.8	39
PRG	SCI authors	65	66	82	72	68	70.6	89
CR2P	SCI authors	82	90	87	86	72	83.4	80

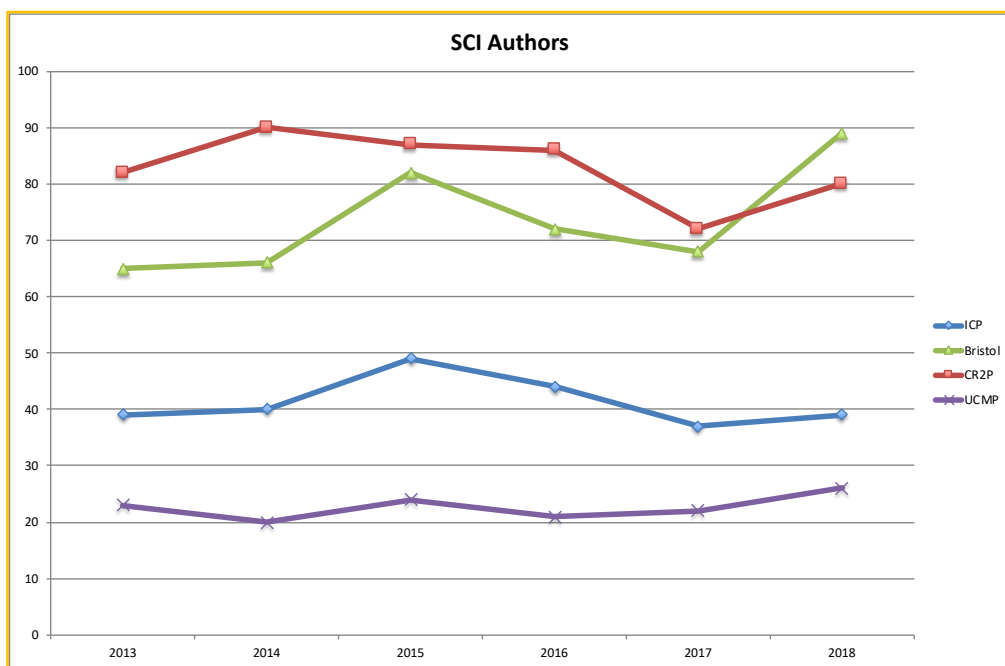
UCMP	SCI authors	23	20	24	21	22	22.0	26
ICP	SCI productivity	1.31	1.50	1.47	1.82	1.70	1.56	1.54
PRG	SCI productivity	1.31	1.59	1.33	1.38	1.21	1.36	1.19
CR2P	SCI productivity	1.30	1.33	1.57	1.64	1.42	1.46	1.35
UCMP	SCI productivity	1.43	1.60	1.71	1.67	1.59	1.60	1.81
ICP	SCI Q1 productivity	0.69	0.75	0.82	0.89	0.92	0.81	0.87
PRG	SCI Q1 productivity	0.92	1.00	1.05	0.97	0.87	0.97	0.74
CR2P	SCI Q1 productivity	0.50	0.63	0.86	0.63	0.68	0.66	0.51
UCMP	SCI Q1 productivity	0.83	0.95	0.96	0.95	1.05	0.95	1.19
ICP	SCI Q1 ratio %	52.9	50.0	55.6	48.8	54.0	52.1	56.7
PRG	SCI Q1 ratio %	70.6	62.9	78.9	70.7	72.0	71.0	62.3
CR2P	SCI Q1 ratio %	38.3	47.5	54.7	38.3	48.0	45.5	38.0
UCMP	SCI Q1 ratio %	57.6	59.4	56.1	57.1	65.7	59.1	66.0
ICP	SCI open access	17	19	13	16	20	17.0	18
PRG	SCI open access	15	20	23	17	15	18.0	15
CR2P	SCI open access	14	11	16	25	21	17.4	14
UCMP	SCI open access	3	4	7	6	4	4.8	9
ICP	SCI open ratio %	33.3	31.7	18.1	20.0	31.75	26.1	30.0
PRG	SCI open ratio %	17.6	19.0	21.1	17.2	18.29	18.8	14.2
CR2P	SCI open ratio %	13.1	9.2	11.7	17.7	20.59	14.3	13.0
UCMP	SCI open ratio %	9.1	12.5	17.1	17.1	11.43	13.6	19.1
ICP	SCI leadership	28	42	36	36	23	33.0	24
PRG	SCI leadership	45	71	71	56	50	58.6	58
CR2P	SCI leadership	58	64	58	57	38	55.0	35
UCMP	SCI leadership	22	15	15	18	25	19.0	29
ICP	Q1 leadership	17	21	24	20	14	19.2	14
PRG	Q1 leadership	35	46	53	40	35	41.8	34
CR2P	Q1 leadership	19	27	31	20	14	22.2	13
UCMP	Q1 leadership	9	6	9	9	18	10.2	19
ICP	SCI leadership ratio %	54.9	70.0	50.0	45.0	36.5	50.6	40.0
PRG	SCI leadership ratio %	52.9	67.6	65.1	56.6	61.0	61.0	54.7
CR2P	SCI leadership ratio %	54.2	53.3	42.3	40.4	37.3	45.3	32.4
UCMP	SCI leadership ratio %	66.7	46.9	36.6	51.4	71.4	54.0	61.7
ICP	Q1 leadership ratio %	63.0	70.0	60.0	51.3	41.2	56.5	41.2
PRG	Q1 leadership ratio %	58.3	69.7	61.6	57.1	59.3	61.3	51.5
CR2P	Q1 leadership ratio %	46.3	47.4	41.3	37.0	28.6	40.2	31.7
UCMP	Q1 leadership ratio %	47.4	31.6	39.1	45.0	78.3	49.0	61.3
ICP	SCI median JIF %ile	86.4	76.3	80.8	73.8	77.3	77.6	82.0
PRG	SCI median JIF %ile	86.4	85.0	90.0	87.6	89.4	88.7	92.6
CR2P	SCI median JIF %ile	57.5	71.4	80.7	67.6	78.2	72.8	64.8
UCMP	SCI median JIF %ile	79.1	78.9	78.6	80.6	84.5	79.7	90.0
ICP	SCI IF GM	2.29	1.88	2.11	1.99	2.17	2.08	2.57
PRG	SCI IF GM	3.24	3.18	3.43	3.63	3.56	3.40	5.01
CR2P	SCI IF GM	1.64	1.82	2.01	2.07	2.29	1.96	1.73
UCMP	SCI IF GM	2.60	2.11	2.93	3.26	3.45	2.85	3.12
ICP	Paleontology	18	24	29	40	26	27.4	20
PRG	Paleontology	24	34	29	21	26	26.8	11
CR2P	Paleontology	52	63	65	57	42	55.8	59
UCMP	Paleontology	11	8	12	8	11	10.0	4
ICP	Multidisciplinary sciences	10	9	12	7	14	10.4	13

PRG	Multidisciplinary sciences	16	23	19	18	15	18.2	18
CR2P	Multidisciplinary sciences	6	8	15	16	16	12.2	10
UCMP	Multidisciplinary sciences	8	5	8	10	8	7.8	7
<i>ICP</i>	<i>%Paleontology</i>	<i>35.3</i>	<i>40.0</i>	<i>40.3</i>	<i>50.0</i>	<i>41.3</i>	42.0	33.3
<i>PRG</i>	<i>%Paleontology</i>	<i>28.2</i>	<i>32.4</i>	<i>26.6</i>	<i>21.2</i>	<i>31.7</i>	27.9	10.4
<i>CR2P</i>	<i>%Paleontology</i>	<i>48.6</i>	<i>52.5</i>	<i>47.4</i>	<i>40.4</i>	<i>41.2</i>	46.0	54.6
<i>UCMP</i>	<i>%Paleontology</i>	<i>33.3</i>	<i>25.0</i>	<i>29.3</i>	<i>22.9</i>	<i>31.4</i>	28.4	8.5
<i>ICP</i>	<i>%Multidisciplinary sci.</i>	<i>19.6</i>	<i>15.0</i>	<i>16.7</i>	<i>8.8</i>	<i>22.2</i>	16.0	21.7
<i>PRG</i>	<i>%Multidisciplinary sci.</i>	<i>18.8</i>	<i>21.9</i>	<i>17.4</i>	<i>18.2</i>	<i>18.3</i>	19.0	17.0
<i>CR2P</i>	<i>%Multidisciplinary sci.</i>	<i>5.6</i>	<i>6.7</i>	<i>10.9</i>	<i>11.3</i>	<i>15.7</i>	10.0	9.3
<i>UCMP</i>	<i>%Multidisciplinary sci.</i>	<i>24.2</i>	<i>15.6</i>	<i>19.5</i>	<i>28.6</i>	<i>22.9</i>	22.2	14.9
<i>ICP</i>	<i>SCI own papers only</i>	<i>8</i>	<i>18</i>	<i>9</i>	<i>15</i>	<i>4</i>	10.8	4
<i>PRG</i>	<i>SCI own papers only</i>	<i>13</i>	<i>21</i>	<i>22</i>	<i>16</i>	<i>13</i>	17.0	14
<i>CR2P</i>	<i>SCI own papers only</i>	<i>25</i>	<i>19</i>	<i>21</i>	<i>22</i>	<i>14</i>	20.2	8
<i>UCMP</i>	<i>SCI own papers only</i>	<i>16</i>	<i>3</i>	<i>4</i>	<i>4</i>	<i>10</i>	7.4	16
<i>ICP</i>	<i>SCI papers int. coll.</i>	<i>31</i>	<i>31</i>	<i>49</i>	<i>52</i>	<i>46</i>	41.8	48
<i>PRG</i>	<i>SCI papers int. coll.</i>	<i>56</i>	<i>62</i>	<i>65</i>	<i>67</i>	<i>50</i>	60.0	75
<i>CR2P</i>	<i>SCI papers int. coll.</i>	<i>68</i>	<i>79</i>	<i>99</i>	<i>100</i>	<i>72</i>	83.6	74
<i>UCMP</i>	<i>SCI papers int. coll.</i>	<i>10</i>	<i>14</i>	<i>27</i>	<i>23</i>	<i>17</i>	18.2	18
<i>ICP</i>	<i>SCI own papers only (%)</i>	<i>15.7</i>	<i>30.0</i>	<i>12.5</i>	<i>18.8</i>	<i>6.3</i>	16.6	6.7
<i>PRG</i>	<i>SCI own papers only (%)</i>	<i>15.3</i>	<i>20.0</i>	<i>20.2</i>	<i>16.2</i>	<i>15.9</i>	17.7	13.2
<i>CR2P</i>	<i>SCI own papers only (%)</i>	<i>23.4</i>	<i>15.8</i>	<i>15.3</i>	<i>15.6</i>	<i>13.7</i>	16.6	7.4
<i>UCMP</i>	<i>SCI own papers only (%)</i>	<i>48.5</i>	<i>9.4</i>	<i>9.8</i>	<i>11.4</i>	<i>28.6</i>	21.0	34.0
<i>ICP</i>	<i>SCI papers int. coll. (%)</i>	<i>60.8</i>	<i>51.7</i>	<i>68.1</i>	<i>65.0</i>	<i>73.0</i>	64.1	80.0
<i>PRG</i>	<i>SCI papers int. coll. (%)</i>	<i>65.9</i>	<i>59.0</i>	<i>59.6</i>	<i>67.7</i>	<i>61.0</i>	62.5	70.8
<i>CR2P</i>	<i>SCI papers int. coll. (%)</i>	<i>63.6</i>	<i>65.8</i>	<i>72.3</i>	<i>70.9</i>	<i>70.6</i>	68.9	68.5
<i>UCMP</i>	<i>SCI papers int. coll. (%)</i>	<i>30.3</i>	<i>43.8</i>	<i>65.9</i>	<i>65.7</i>	<i>48.6</i>	51.7	38.3
<i>ICP</i>	<i>Total collaborations</i>	<i>127</i>	<i>120</i>	<i>227</i>	<i>206</i>	<i>177</i>	171.4	199
<i>PRG</i>	<i>Total collaborations</i>	<i>260</i>	<i>244</i>	<i>305</i>	<i>298</i>	<i>220</i>	265.4	319
<i>CR2P</i>	<i>Total collaborations</i>	<i>250</i>	<i>318</i>	<i>427</i>	<i>702</i>	<i>265</i>	392.4	382
<i>UCMP</i>	<i>Total collaborations</i>	<i>56</i>	<i>89</i>	<i>206</i>	<i>162</i>	<i>111</i>	124.8	92
<i>ICP</i>	<i>International collaborations</i>	<i>73</i>	<i>74</i>	<i>145</i>	<i>117</i>	<i>104</i>	102.6	150
<i>PRG</i>	<i>International collaborations</i>	<i>208</i>	<i>165</i>	<i>231</i>	<i>217</i>	<i>190</i>	202.2	232
<i>CR2P</i>	<i>International collaborations</i>	<i>169</i>	<i>179</i>	<i>289</i>	<i>567</i>	<i>189</i>	278.6	218
<i>UCMP</i>	<i>International collaborations</i>	<i>23</i>	<i>22</i>	<i>130</i>	<i>78</i>	<i>59</i>	62.4	34
<i>ICP</i>	<i>International coll. (%)</i>	<i>57.5</i>	<i>61.7</i>	<i>63.9</i>	<i>56.8</i>	<i>58.8</i>	59.9	75.4
<i>PRG</i>	<i>International coll. (%)</i>	<i>80.0</i>	<i>67.6</i>	<i>75.7</i>	<i>72.8</i>	<i>86.4</i>	76.2	72.7
<i>CR2P</i>	<i>International coll. (%)</i>	<i>67.6</i>	<i>56.3</i>	<i>67.7</i>	<i>80.8</i>	<i>71.3</i>	71.0	57.1
<i>UCMP</i>	<i>International coll. (%)</i>	<i>41.1</i>	<i>24.7</i>	<i>63.1</i>	<i>48.1</i>	<i>53.2</i>	50.0	37.0

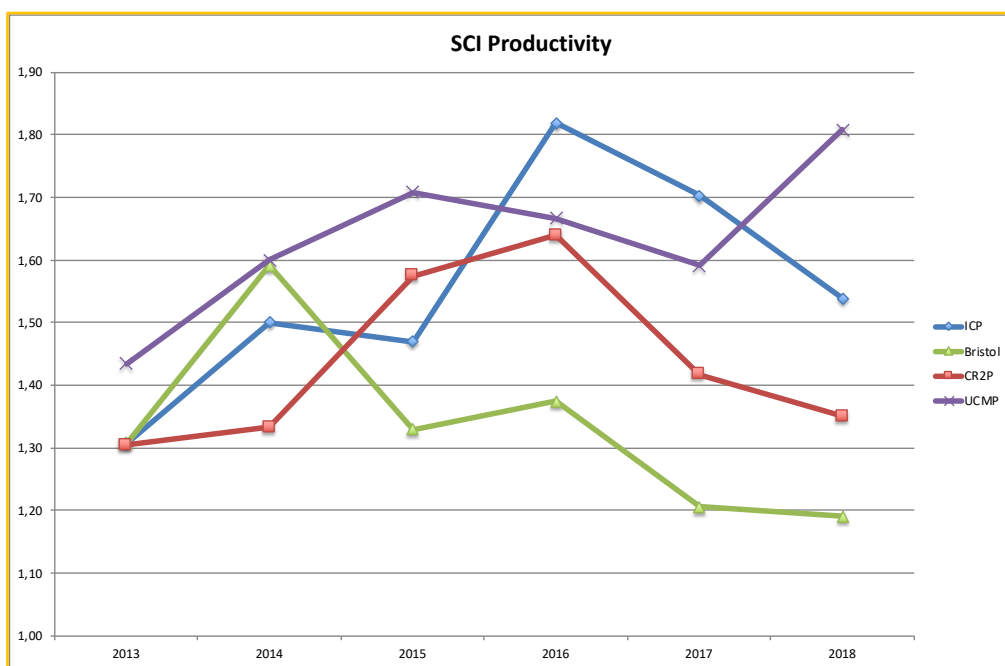
Production. The ICP is the third institution in total SCI production and Q1 SCI production, both in 2018 and in the average of the preceding five years.

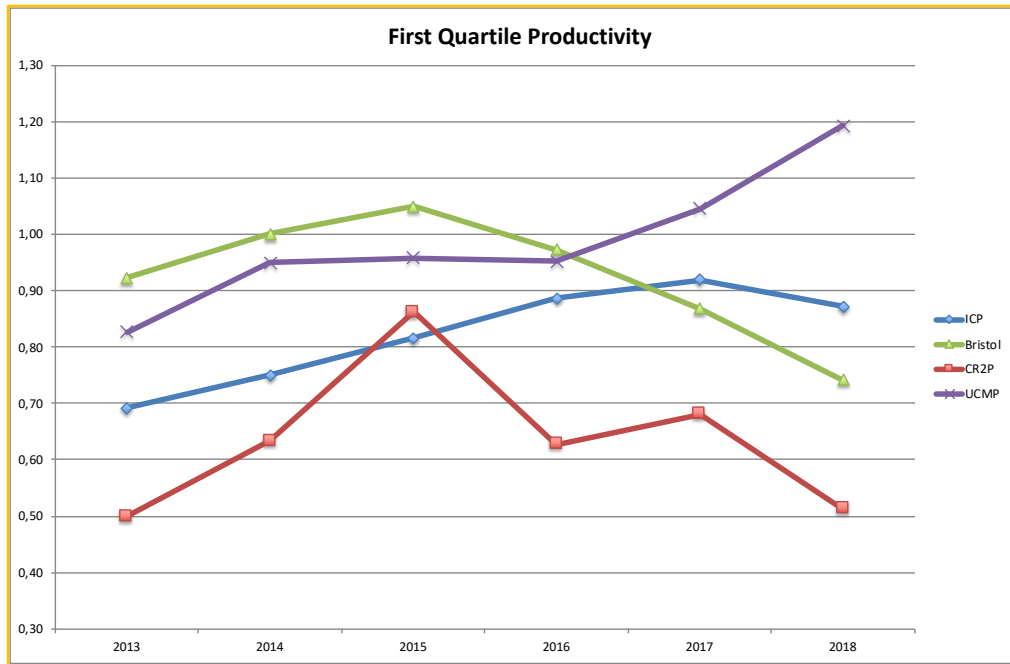


Productivity. The above-mentioned differences in total SCI and Q1 production are largely attributable to differences in the number of authors of each institution, with the ICP being similarly the third.

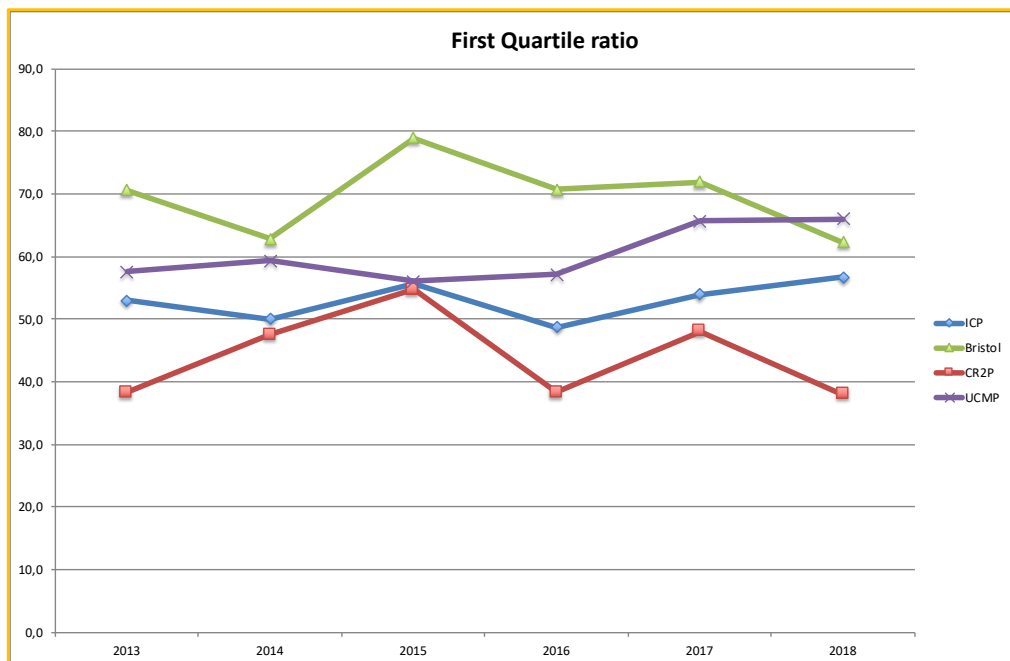


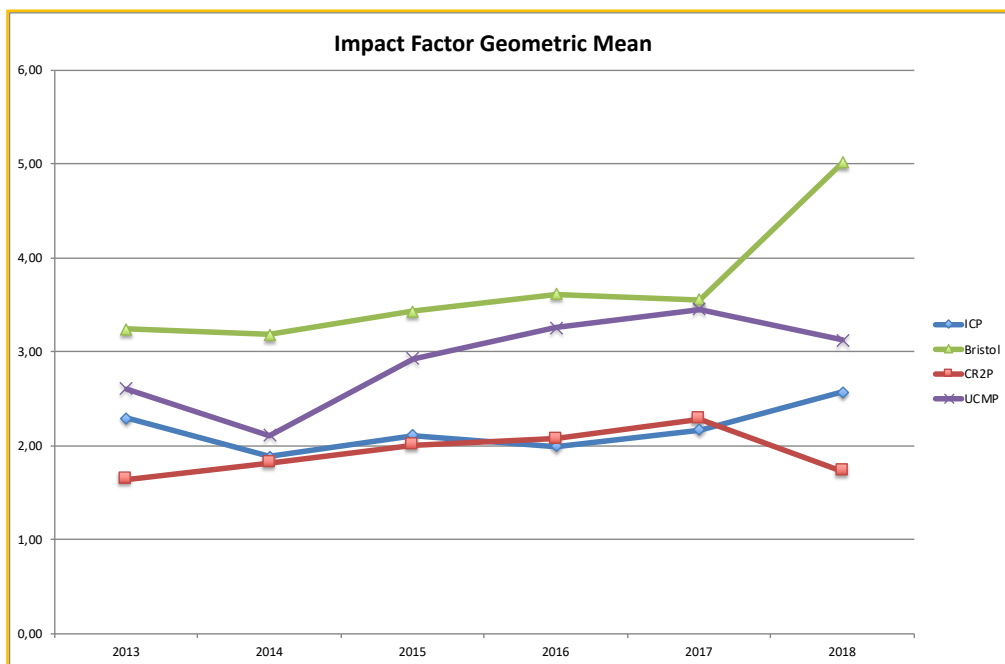
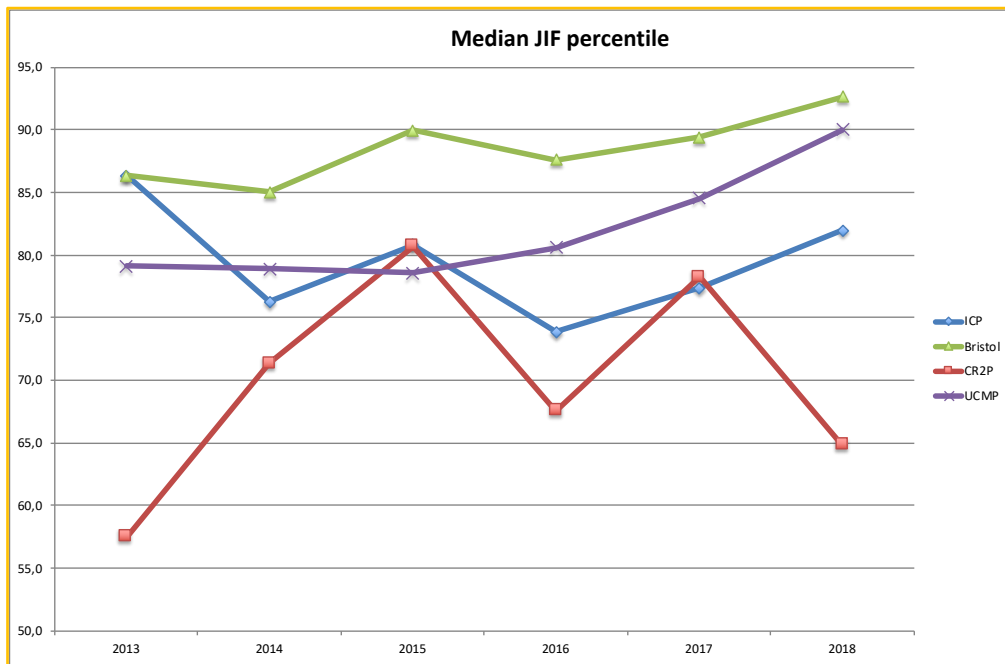
When productivity is computed by dividing production by authors, it emerges that the ICP is the second institution in total SCI productivity and Q1 productivity for 2018. When the average of the five preceding years is computed, then the ICP is the second and third, respectively.



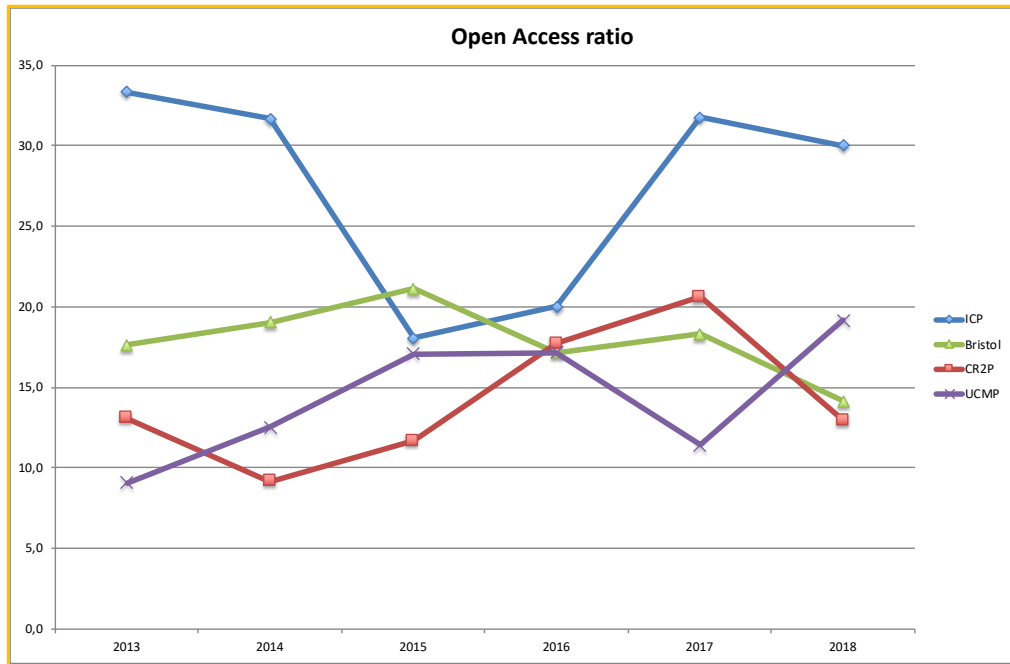


Quality and impact. With regard to the percentage of papers published in first quartile SCI journals, the ICP is the third institution both for 2018 and for the average of the five preceding years. Very similar results (ICP the third) are obtained based on the median percentile and the geometric mean of the impact factor, both for 2018 and the five preceding years.

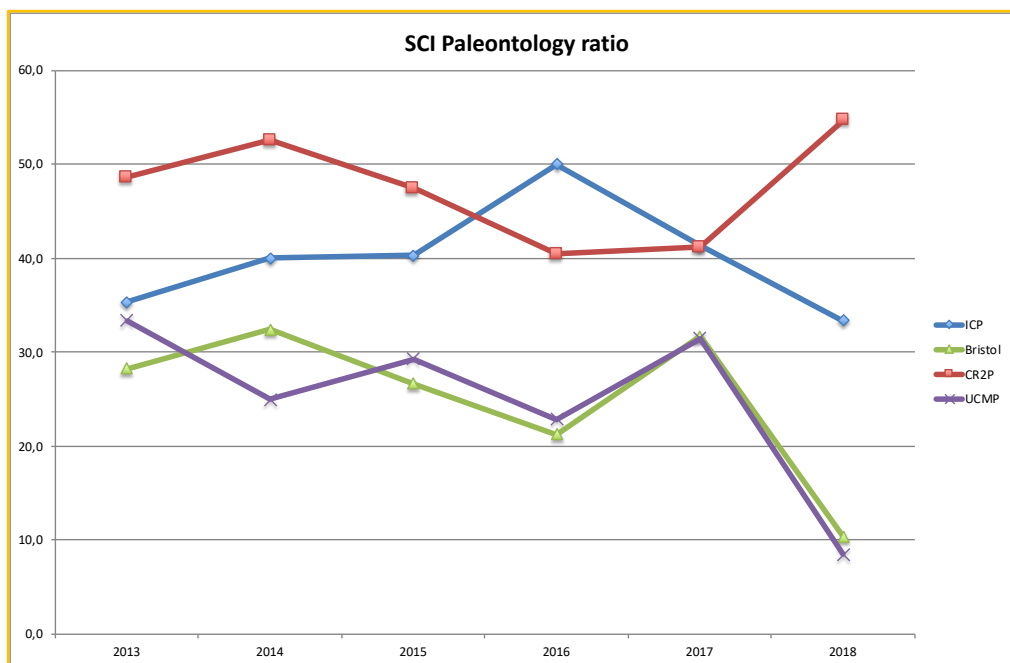


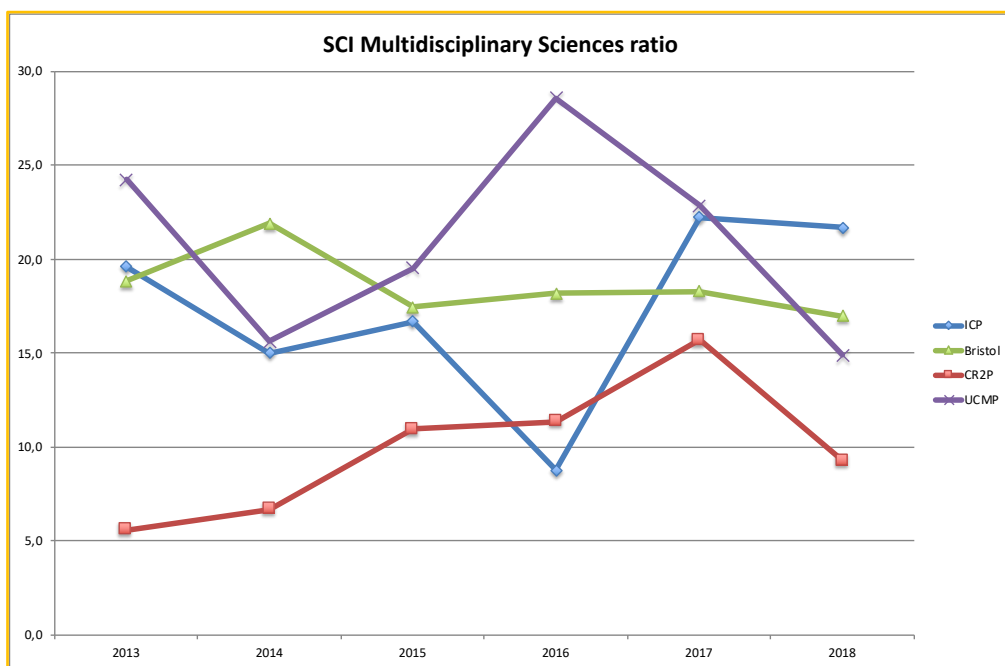


Open access. The ICP occupies the third position in percentage of SCI papers published in OA journals based on the average of the five preceding years, but the first position when only 2018 is considered.

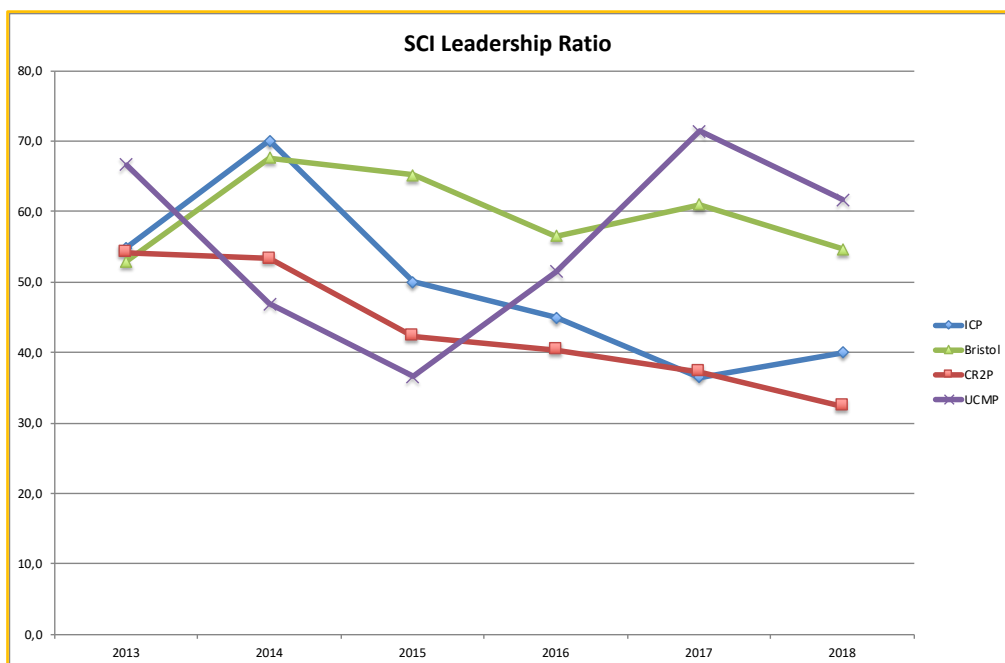


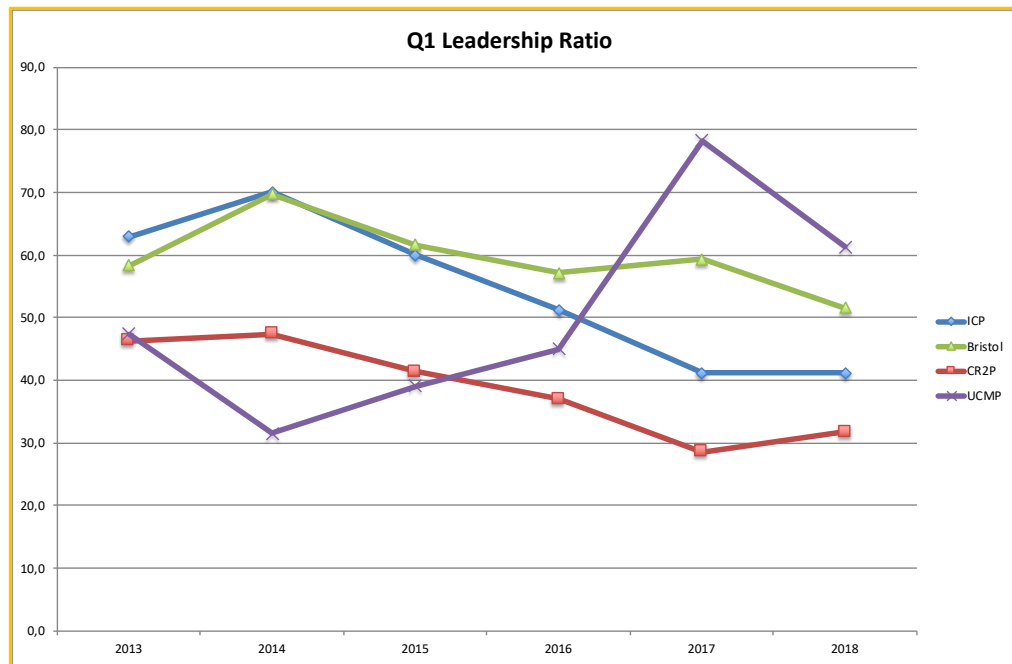
Discipline specificity and multidisciplinary. Based on the proportion of papers published in SCI journals from the category ‘Paleontology’, the ICP occupies the second position for both 2018 and the five preceding years. In terms of papers published in the category ‘Multidisciplinary sciences’, the ICP occupies the third position for 2013-2017 but the first one when only 2018 is taken into account.



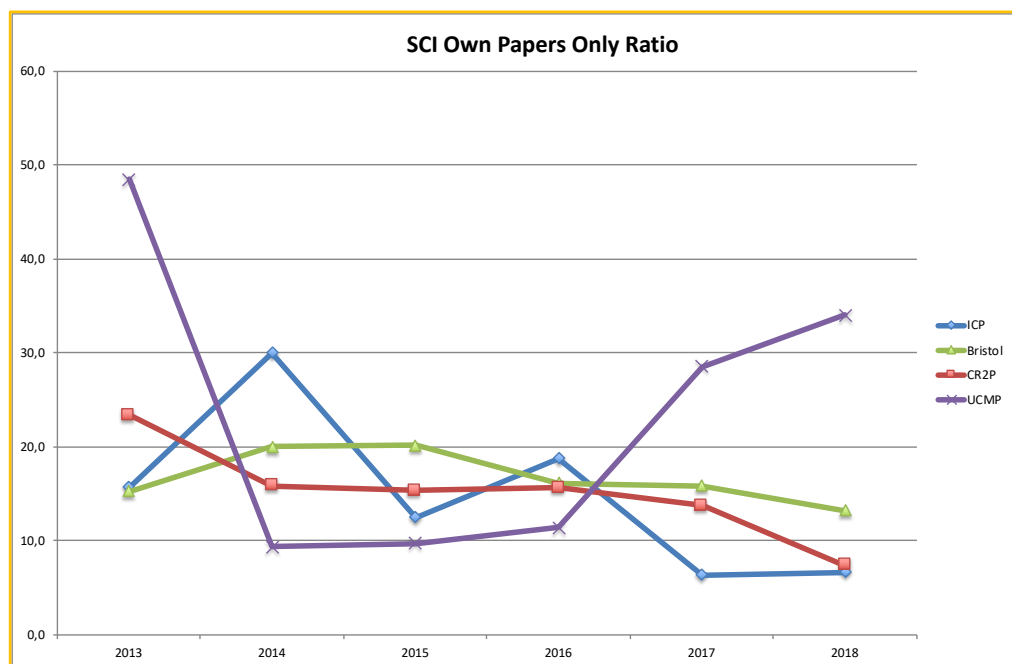


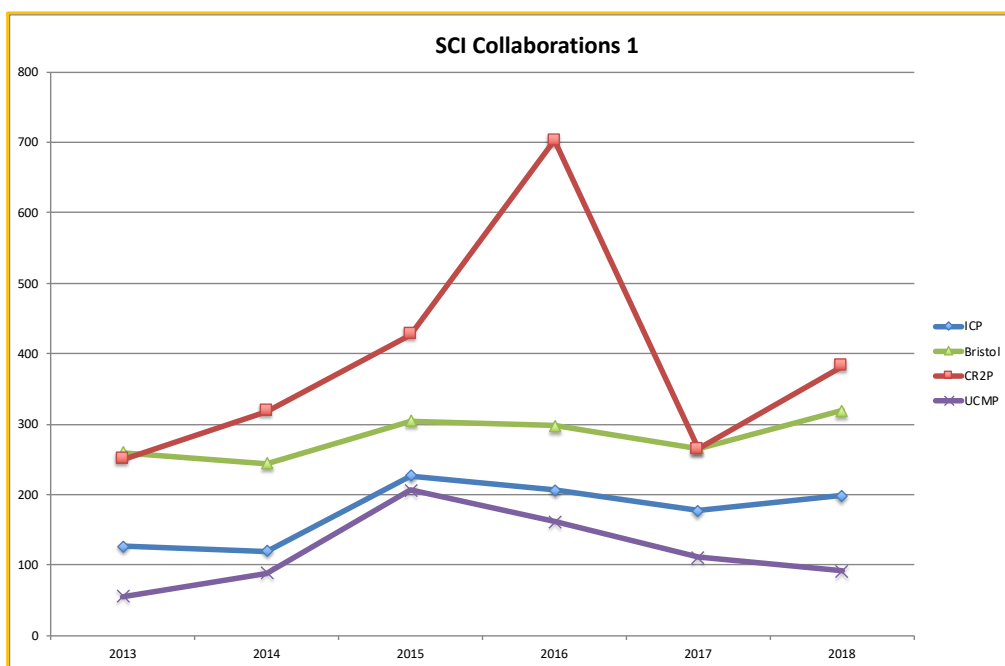
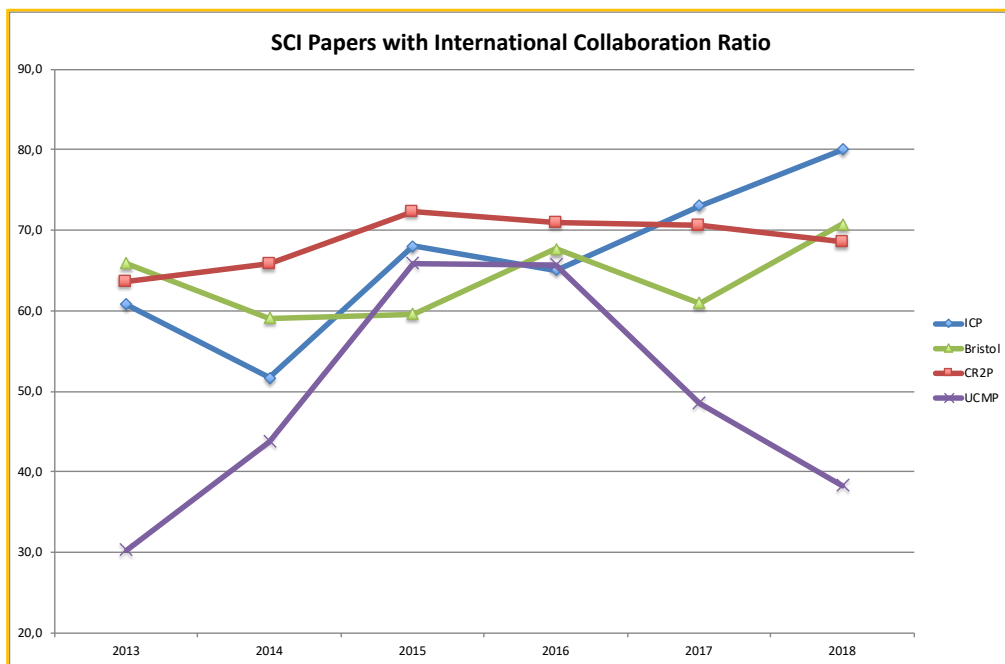
Leadership. The ICP ranks as the third institution in terms of SCI leadership (as measured by the corresponding author) for both 2018 and the five preceding years. When only Q1 leadership is considered, the ICP is also the third institution for 2018 but the second when the five preceding years are considered.





Self-sufficiency, collaborations and internationalization. For self-sufficiency in publication, as measured by the ratio of SCI papers exclusively (co)authored by researchers with ICP affiliation, the ICP appears the third for the five preceding years and the fourth for 2018. Opposite results are obtained for the ratio of papers with international collaboration(s), for which the ICP is recovered as the second institution for 2013-2017 and as the first one for 2018. When collaborations are measured on the basis of the other affiliations included in SCI papers from each institution, it emerges that the ICP is the first institution for 2018, although it occupies only the third position when the five preceding years are considered.



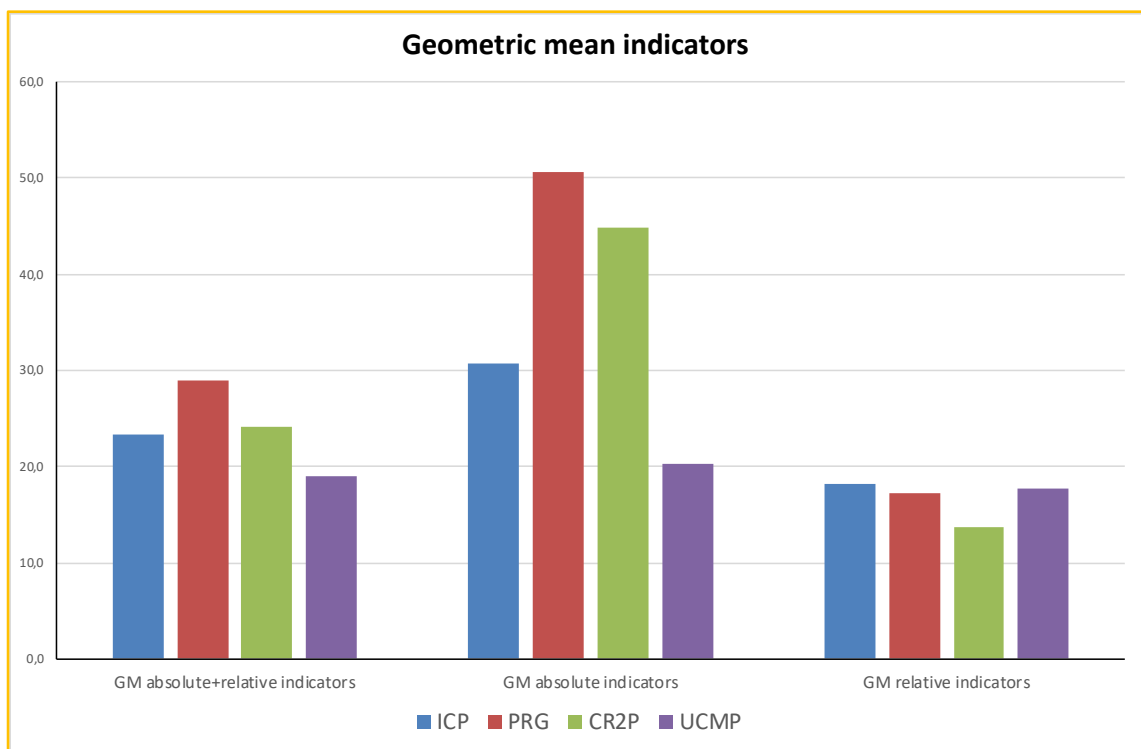


Summary results and rankings. The results for the 2013-2017 annual average values and the 2018 values can be compared by means of two synthetic metrics: the geometric mean (GM) of the indicators; and the GM of the indicators relative to that of the institution with the highest GM (in %). The results are reported for all indicators together, as well as for absolute and relative indicators separately, both in table and in histogram format below.

When both absolute and relative indicators are considered simultaneously (histograms to the left) the ICP is ranked as the third institution, below Bristol (first one) and Paris (second one), and only followed by Berkeley. These results coincide with those yielded by absolute indicators (central histograms). In contrast, when only relative (i.e., size-corrected) indicators

are considered (histograms to the right), the ICP is ranked as the first institution, followed by Berkeley, Bristol, and Paris. Thus, while the performance of the ICP (based on the geometric mean) is barely more than 60% that of Bristol based on absolute indicators, when relative indicators (which correct for size differences between institutions) are considered, the performance of Bristol is 95% that of the ICP (100%), which is closely followed by Berkeley (98%), with Paris in the fourth place (75%). Similar results were obtained for the ICP by considering the average of the last preceding years, except that on the basis of relative indicators the ICP was ranked second instead of first (93% of Bristol's relative performance). In this sense, the relative performance of the ICP has comparatively improved.

SUMMARY METRICS	2013-2017				2018			
	ICP	PRG	CR2P	UCMP	ICP	PRG	CR2P	UCMP
GM absolute+relative indicators	24.9	32.2	30.1	18.2	23.4	28.9	24.2	18.9
GM absolute+relative indicators relative to PRG	77.3	100.0	93.6	56.5	80.7	100.0	83.5	65.4
GM absolute indicators	33.8	53.5	58.1	18.1	30.8	50.6	44.8	20.2
GM absolute indicators relative to CR2P/PRG	58.2	91.9	100.0	31.1	60.8	100.0	88.5	40.0
GM relative indicators	18.7	20.1	16.4	18.3	18.1	17.3	13.7	17.8
GM relative indicators relative to PRG/ICP	92.9	100.0	81.5	90.8	100.0	95.2	75.3	98.0



Absolute indicators better depict the global impact of a given institution among the international scientific community, but relative indicators are size-corrected and therefore are more reliable to evaluate the performance of a given institution irrespective of its size. In the latter regard, the results obtained for the ICP are rather satisfactory, being fully comparable to (indeed, slightly better than) those of Bristol (an institution that can arguably be considered the best paleontological center in the world) as well as Berkeley (a similarly most prestigious

paleontological center that is more comparable to the ICP in organizational structure). All in all, the analysis performed here confirms that the ICP is performing exceedingly well as far as research outputs are concerned, and suggests that the limitations in the global impact of the institution are almost entirely determined by its current size (i.e., by the number of payroll researchers as well as research associates).

CERCA evaluation

Evaluation Commission. A formal evaluation of the ICP was performed by the CERCA institution on 29 October 2018, by means of an Evaluation Commission (EC) composed by members of the ICP Scientific Advisory Board as well as independent members from abroad. The composition of the EC was the following:

- Philippa Christoforou, Oxford University Innovation, UK.
- Charles Marshall, Museum of Paleontology - University of California, Berkeley, USA.
- Jorge Morales, National Museum of Natural Sciences, Spain.
- Isabel Palmtag, Max Planck Institute for Evolutionary Biology, Germany.
- Lorenzo Rook, Università di Firenze, Italy.
- José Luis Sanz, Autonomous University of Madrid, Spain.
- Lluís Rovira, CERCA, Catalonia (Rapporteur).
- David Fernández, General Directorate for Research, Catalonia (Assistant to Dr. Rovira).

Self-assessment. The evaluation of the ICP by the EC was based on the responses provided by the ICP Director to the Evaluation Questionnaire elaborated by CERCA (submitted in August 2018) as well as by a presentation performed on 29 October 2018 in front of the EC.

The CERCA Evaluation Questionnaire asked the ICP Director to self-assess the performance of the institution based on the following classification: (A) Outstanding performance, placing the centre among the top international performing institutions on its field; (B) Very good, with excellent results at national level although some pending issues to be addressed at the international scenario; (C) Fair, good performance at national level although focus on some strategic issues is required to allow the centre have a feasible performance in the next years; and (D) Clear need for improvement, the center should be reoriented or transformed since the current structure and/or performance does not provide guarantees for the Board of Trustees. The ICP Director concluded that the level of performance of the ICP between 2013 and 2017 oscillated between an 'A' (outstanding performance) and 'B' (very good performance). Quoting from the questionnaire:

“In terms of scientific outputs, the ICP is clearly placed among the top international institutions on the field of vertebrate paleontology and paleoanthropology with regard to productivity, impact, international visibility and collaborations. Relative (size-independent) indicators denote that the performance of the ICP is outstanding, being almost comparable to

that of the most prestigious paleobiological research institution in the world. The results delivered by absolute indicators are very good, albeit less exceptional in quantitative terms, reflecting that, even if the ICP is currently competitive with top paleontological institutions worldwide, its impact is limited by an as yet insufficient number of researchers (both in absolute terms and as compared to technicians and administrative staff). The latter caveat is not attributable to a bad planification by the founding Director, rather the contrary: it is the direct result of the severe budget cuts that, due to the economical crisis, in 2010 truncated the growth plans of the then very young institute (as anticipated in the previous, 2010-2013 Strategic Plan), and in 2011-2013 obligated to downsize further the center. In the light of these adverse circumstances, it is most remarkable that the ICP has maintained very good levels of productivity and impact, and arguably preserves its potential to grow and expand further as soon as the conjuncture is favorable enough. When taken together, all of these factors justify an 'A' qualification."

"On the other hand, from managerial and fundraising viewpoints, the ICP has some pending issues, particularly at the international level, which might alternatively justify a 'B' qualification when the global performance of the institution as a whole is taken into account. In particular, improvement is required regarding: the need to increase of the ratio between competitive funding (especially from Europe) plus service provision income relative to the basal budget (so as to overcome the currently delicate financial situation); to boost talent attraction and retention by means of explicit open, transparent and merit-based recruitment policies in the framework of HRS4R implementation (currently limited by low salaries); and to improve the sex ratio of the institution, particularly at executive and managerial hierarchical levels, while fostering further non-discrimination policies at our center. Nevertheless, all these aspects are adequately covered by both the HRS4R Action Plan and the various strategic aims included in the new Strategic Plan (2018-2021) of the ICP, both recently approved by the Board of Trustees, together with a Viability Plan intended to overcome in a few years the small deficit that has accumulated during the last years. The fact that ICP was recently granted with the HR Excellence in Research award of the EU clearly attests that the center is in the right way to correct the above-mentioned shortcomings. Indeed, such recognition constitutes an additional argument to support the highest possible qualification for the ICP."

Overall, in the light of the adverse historical circumstances, the meager current levels of basal funding, the extensive measures implemented during the last year to circumvent the problems of the institution, the outstanding performance in terms of research, and the promising prospects for the future, the ICP Director favored an 'A' qualification ('outstanding performance').

Conclusions of the evaluation and overall qualification. The conclusions of the EC were transmitted verbally to the ICP Director at the end of the evaluation process on 29 October 2019 and further elaborated in a written report subsequently elaborated by the EC and sent to the ICP Director on 27 December 2018. This report provided an overall qualification based on

the A-D ranking explained above, as well as a series of conclusions and recommendations aimed to improve the performance of the ICP in years to come. The main conclusions are summarized below, being organized into the various aspects distinguished on the report:

1. Achievement of the recommendations stated in the first evaluation report (2013):

- **Conclusion 1:** The EC established that most of the recommendations stated in the first evaluation report have been fulfilled. However, some of them have just been partially completed: Recommendation 2. Increase ICP-UAB collaboration; Recommendation 5. Market survey to analyse real potential of the Museum; Recommendation 8. Benchmark with other institutions the management of IP issues. In such cases the EC was supportive for the rationale and reasons for partial implementation. The only exception was with regard Recommendation 2 about the affiliation of UAB professors to ICP in order to reinforce critical mass for the Institute and join a larger qualified team for challenging projects.

2. Scientific production and productivity:

- **Conclusion 2:** The scientific production of the Institute is very good at international level, showing prominent publications with a certain level of leadership.
- **Conclusion 3:** As regards competitive funding of projects, the EC noted that at the moment no European funding has been awarded to ICP.
- **Conclusion 4:** The EC is aware that the communication between ICP and the members of its Scientific Advisory Board (SAB) is done by e-mail when that is required. Until now, however, no formal and face-to-face meetings have been organised.
- **Conclusion 5:** From the point of view of scientific performance and financial solvency, the EC identifies a risk for the Institute due to the likelihood of the retirement of two Senior Group Leaders in the next few years. The financial risk stems from the fact that their salaries are external to ICP, and thus that their retirements may mean a substantial loss in resources available to hire replacements.
- **Conclusion 6:** The EC is aware that the industrial Computed Tomography (CT) scan of ICP is currently damaged and is very expensive to fix, given current ICP fund.
- **Conclusion 7:** The EC believes it is very important to maintain the network of associate researchers in ICP to improve the visibility and influence of the Institute abroad.

3. Management of ICP:

- **Conclusion 8:** Substantial progress has been made during the review period in developing ICP-Universitat Autònoma de Barcelona (UAB) relations. Nonetheless, while ICP seems well integrated into UAB, the converse is uncertain.
- **Conclusion 8':** The EC is aware of the efforts undertaken by the Director and the Institute to balance the gender issue and readdress the situation.

4. Knowledge and technology transfer activities:

- **Conclusion 9:** ICP has been effective delivering income from services and consulting.

5. Outreach and dissemination activities:

- **Conclusion 10:** The level of outreach and scientific dissemination of ICP is very good, reaching very good targets at national and international level.
- **6. Overall qualification:**
- Within the EC, there was a lively discussion about which is the overall qualification of the ICP performance during the evaluated period (2013-2017). The EC has taken into account the significant progress highlighted in this report, the high degree of fulfilment of the recommendations stated in the first evaluation report, the scientific production and productivity, the excellent management of the Centre, the performance in the knowledge transfer activities and the outreach and dissemination activities. The EC would like to acknowledge with thanks the hard and excellent work undertaken by Dr David M. Alba, director of ICP, during the last period. The EC trusts that the institute will keep improving in the next period.
- On this basis, the EC awarded the qualification of B to ICP. Nevertheless, some members of the EC considered that ICP deserved an upmost qualification.

Recommendations of the evaluation. In relation to most of the conclusions above, the evaluation report included 13 recommendations by the EC. They are the following:

- **Recommendation 1:** The EC believes that this issue [lack of European funding] is one of the main challenges for the Institute for the next period. ICP should work hard to improve the current situation, leveraging its strengths. ICP has the potential to gain ERC funding, for instance, via the research collaboration agreement involving an ICREA Research Professor of the Universitat Pompeu Fabra (UPF) in the area of palaeogenetics and palaeoproteomics, which could lead to an interdisciplinary project. ICP should also apply to ERC Synergy Grants, in collaboration with other prestigious institutions in the European arena (for instance, in the field of climate change research).
- **Recommendation 2:** The EC recommends that the Institute schedules at least one meeting of the SAB every two years at ICP headquarters. An agenda of the meeting should be made and delivered to the members of the SAB before the meeting. This procedure will be useful to support the scientific decisions of importance to be taken in the Institute.
- **Recommendation 3:** At the same time, the EC recommends to renew the composition of the SAB as well as to define duties and agenda in advance to optimise its contribution. Consider inviting some foreign ERC grantees to join the Board, by seeking new members that can help optimise ICP's approach for gaining ERC funding.
- **Recommendation 4:** The likely retirement of two Senior Group Leaders should be addressed during this next period, trying to define a strategy to replace the Group Leaders before that happens and taking into account that current ICP researchers are not eligible for permanent ICREA contracts.
- **Recommendation 4':** ICP needs to balance the beneficial impact of having again fully operational the scan and the cost of fixing this equipment.

- **Recommendation 5:** At the same time, the EC believes that ICP could explore the access to other scientific facilities, such as synchrotrons (not only ALBA, but also the European Synchrotron Radiation Facility-ESRF in Grenoble), which may open the framework for new ambitious projects, collaborations and funding.
- **Recommendation 6:** The EC recommends articulating the network, in the sense of creating some simple rules or strategies to deal with the criteria for membership within the network as well as making explicit their contributions to ICP. Documentation, on a case by case basis, should be prepared for each associate member, recognising that the details of the contributions are highly variable (oversight of upcoming publications, share of ICP news in social media accounts, etc.)
- **Recommendation 7:** The EC believes that both ICP-UAB should have a common strategy in the palaeontology area. ICP should try to be more pro-active, trying to look for benefits in this collaboration with the University.
- **Recommendation 8:** ICP should try to affiliate professors from the University. A bottom-up approach of trying to convince individual researchers of the benefits being affiliated with ICP should be promoted. The Board of Trustees (BoT) of ICP should discuss this issue and, where possible, facilitate solutions.
- **Recommendation 9:** With regard to the recruitment strategy of ICP, the EC believes that it should be continued in order to implement an open and transparent procedure. The EC recommends not automatically prioritising associate researchers of ICP in order to facilitate external applicants. However, the EC also recognises that sometimes the needs of the ICP might only be met by candidates deeply familiar with the collections and associated research of ICP, expertise that might only be available via internal applicants. But even in these cases, calls should be always open and international.
- **Recommendation 10:** The EC believes ICP should always keep in mind this unbalanced current situation at the upper levels of management and consider solving it in all future positions.
- **Recommendation 11:** With regards to fundraising, the EC recommends ICP begin organising events to engage donors and philanthropic Foundations, among other actions. ICP should provide them with information on some specific projects to be funded in ICP. Maybe the BoT could give support to facilitate donors' attendance at the event, for example by inviting people from their networks. Some topics like Catalan heritage of dinosaurs could encourage donors to get engaged to ICP. Cultivating major donors is a long-term commitment and can be very difficult, so it will be important to develop a long-term plan.
- **Recommendation 12:** The EC strongly recommends ICP try to keep a certain level of equity in those companies born from the Institute. That would allow ICP to maintain a certain degree of control of the company and eventually, if required, preserving the reputation of the Institute, as well as strengthening the visibility and impact of ICP.

FINAL NOTE

This Annual Report was written by the ICP Director in January-February 2019, with inputs from the other members of the Steering Committee. The final version is dated to 20 March 2019.

It will be presented by to the ICP Board of Trustees for their approval as soon as the next meeting takes place.

DAVID M. ALBA
Director

APPENDIX

ICP publications 2018

The following list includes the publications (co)authored by authors with ICP affiliation in 2018, distributed in the different categories recognized in this report. Only those papers published in final form are included; those published online in 2018 without volume and pagination, pending publication in 2019, have been excluded (pending their inclusion in the 2019 Annual Report).

SCI papers (indexed in JCR)

1. Alba, D.M., Hammond, A., Vinuesa, V. & Casanovas-Vilar, I. (2018, published online). First record of a Miocene pangolin (Pholidota, Manoidea) from the Iberian Peninsula. *Journal of Vertebrate Paleontology*, 38, e1424716. <https://doi.org/10.1080/02724634.2017.1424716>
2. Alba, D. M., Casanovas-Vilar, I., Furió, M., García-Paredes, I., Angelone, C., Jovells-Vaqué, S., Luján, À. H., Almécija, S., & Moyà-Solà, S. (2018). Can Pallars i Llobateres: A new hominoid-bearing locality from the late Miocene of the Vallès-Penedès Basin (NE Iberian Peninsula). *Journal of Human Evolution*, 121, 193-203. <https://doi.org/10.1016/j.jhevol.2018.04.008>
3. Alba, D. M., Delson, E., Morales, J., Montoya, P., & Romero, G. (2018). Macaque remains from the early Pliocene of the Iberian Peninsula. *Journal of Human Evolution*, 123, 141-147. <https://doi.org/10.1016/j.jhevol.2018.07.005>
4. Angelone, C., Čermák, S., Moncunill-Solé, B., Quintana, J., Tuveri, C., Arca, M., & Kotsakis, T. (2018). Systematics and paleobiogeography of *Sardolagus obscurus* n. gen. n. sp. (Leporidae, Lagomorpha) from the early Pleistocene of Sardinia. *Journal of Paleontology*, 92, 506-522. <https://doi.org/10.1017/jpa.2017.144>
5. Blanco, F., Gómez Cano, A. R., Cantalapedra, J. L., Domingo, M. S., Domingo, L., Menéndez, I., Flynn, L. J., & Hernández Fernández, M. (2018). Differential responses of Miocene rodent metacommunities to global climatic changes were mediated by environmental context. *Scientific Reports*, 8, 2502. <https://doi.org/10.1038/s41598-018-20900-5>
6. Britt, B. B., Dalla Vecchia, F. M., Chure, D. J., Engelmann, G. F., Whiting, M. F., & Scheetz, R. D. (2018). *Caelestiventus hansenii* gen. et sp. nov. extends the desert-dwelling pterosaur record back 65 million years. *Nature Ecology & Evolution*, 2, 1386-1392. <https://doi.org/10.1038/s41559-018-0627-y>
7. Cadena, E., Abella, J., & Gregori, M. (2018). The first Oligocene sea turtle (Pan-Cheloniidae) record of South America. *PeerJ*, 6, e4554. <https://doi.org/10.7717/peerj.4554>
8. Casanovas-Vilar, I., Garcia-Porta, J., Fortuny, J., Sanisidro, Ó., Prieto, J., Querejeta, M., Llácer, S., Robles, J. M., Bernardini, F., & Alba, D. M. (2018). Oldest skeleton of a fossil flying squirrel casts new light on the phylogeny of the group. *eLife*, 7, e39270. <https://doi.org/10.7554/eLife.39270>
9. Cossu, I. L., Frau, S., Delfino, M., Chiodi, A., Corti, C., & Bellati, A. (2018). First report of *Bufo bufo* (Linnaeus, 1758) from Sardinia (Italy). *Acta Herpetologica*, 13, 43-49. http://dx.doi.org/10.13128/Acta_Herpetol-21867
10. Crespo, V. D., Furió, M., Ruiz-Sánchez, F. J., & Montoya, P. (2018). A new species of *Plesiodimylus* (Dimylidae, Eulipotyphla, Mammalia) from the Early Miocene of Spain. *Historical Biology*, 30, 360-371. <https://doi.org/10.1080/08912963.2017.1289519>

11. Dalla Vecchia, F. (2018). Comments on Triassic pterosaurs with a commentary on the "ontogenetic stages" of Kellner (2015) and the validity of *Bergamodactylus wildi*. *Rivista Italiana di Paleontologia e Stratigrafia*, 124, 317-341. <https://doi.org/10.13130/2039-4942/10099>
12. Delfino, M., & Sánchez-Villagra, M. (2018). A late Miocene pipine frog from the Urumaco Formation, Venezuela. *Ameghiniana*, 55, 210-214. <https://doi.org/10.5710/AMGH.04.10.2017.3136>
13. Delfino, M., Candilio, F., Carnevale, G., Coppa, A., Medin, T., Pavia, M., Rook, L., Urciuoli, A., & Villa, A. (2018). The early Pleistocene vertebrate fauna of Mulhuli-Amo (Buia area, Danakil Depression, Eritrea). *Bollettino della Società Paleontologica Italiana*, 57, 27-44. <https://doi.org/10.4435/BSPI.2018.02>
14. DeMiguel, D., & Rook, L. (2018). Understanding climate's influence on the extinction of *Oreopithecus* (late Miocene, Tusco-Sardinian paleobioprovince, Italy). *Journal of Human Evolution*, 116, 14-26. <https://doi.org/10.1016/j.jhevol.2017.11.008>
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16. Fondevilla, V., Dalla Vecchia, F. M., Gaete, R., Galobart, À., Moncunill-Solé, B., & Köhler, M. (2018). Ontogeny and taxonomy of the hadrosaur (Dinosauria, Ornithopoda) remains from Basturs Poble bonebed (late early Maastrichtian, Tremp Syncline, Spain). *PLoS ONE*, 13, e0206287. <https://doi.org/10.1371/journal.pone.0206287>
17. Fortuny, J., Gastou, S., Escuillié, F., Ranivoharimanana, L., & Steyer, J.-S. (2018). A new extreme longirostrine temnospondyl from the Triassic of Madagascar: phylogenetic and palaeobiogeographical implications for trematosaurids. *Journal of Systematic Palaeontology*, 16, 675-688. <https://doi.org/10.1080/14772019.2017.1335805>
18. Frazier, J. G., Azzarà, V., Munoz, O., Marcucci, L. G., Badel, E., Genchi, F., Cattani, M., Tosi, M., & Delfino, M. (2018). Remains of Leatherback turtles, *Dermochelys coriacea*, at Mid-Late Holocene archaeological sites in coastal Oman: clues of past worlds. *PeerJ*, 6, e6123. <https://doi.org/10.7717/peerj.6123>
19. Furió, M., van den Hoek Ostende, L., Agustí, J., & Minwer-Barakat, R. (2018). Evolución de las asociaciones de insectívoros (Eulipotyphla, Mammalia) en España y su relación con los cambios climáticos del Neógeno y el Cuaternario. *Ecosistemas*, 27, 38-51. <https://doi.org/10.7818/ECOS.1454>
20. Georgalis, G. L., Villa, A., & Delfino, M. (2018). The last amphisbaenian (Squamata) from continental Eastern Europe. *Annales de Paléontologie*, 104, 155-159. <https://doi.org/10.1016/j.annpal.2018.03.002>
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22. Gilbert, C. C., Frost, S. R., Pugh, K. D., Anderson, M., & Delson, E. (2018). Evolution of the modern baboon (*Papio hamadryas*): A reassessment of the African Plio-Pleistocene record. *Journal of Human Evolution*, 122, 38-69. <https://doi.org/10.1016/j.jhevol.2018.04.012>
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