

# Jerónimo Carranza Carranza

Data Scientist, Statistician and Biologist  
DS, GIS & ENVIRONMENTAL CONSULTANT



## + PERSONAL INFORMATION

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Date of birth 1963-03-07

Place of birth La Algaba - Seville (Spain)

## + PROFESSIONAL HISTORY

10/2016 - Today **ASTERIONAT - ASTERION ASISTENCIA TÉCNICA, S.L.U.** [www.asterionat.com](http://www.asterionat.com)

Position Founder and CEO.

06/2016 - Today **DS, GIS, & ENVIRONMENTAL CONSULTANT**

Position Consultant in the areas of GIS, Development, Statistics, Planning and Environment.

09/2002 - 06/2016 **TÉCNICA Y PROYECTOS, S.A. (TYP SA)**

Position Head of Territorial Information Department of TYP SA Group in Andalusia.  
Technical Coordinator of GIS Area in TYP SA Group.

Main activities and responsibilities Management and Directorate of Department: Technical, Organizational and Commercial.  
Head of Projects: GIS, Remote Sensing and Statistics.  
Technical Coordination of GIS Area.

02/2001 - 02/2002 **TÉCNICA Y PROYECTOS, S.A. (TYP SA)**

Position Environmental Consultant.

Main activities and responsibilities Environmental Consultant in Studies, Projects and Works of Civil Engineering.  
Environmental monitoring and advice in the works of Andévalo Dam.  
Studies and projects, concerning environmental impact assessment, environmental mitigation measures projects, monitoring requirements, environmental advice, geographic information systems, urban planning and ecological cartography.

01/1989 - 02/2001 **BIOCORA Consultores, S.L.**

Position Manager. Founding Partner.

Main activities and responsibilities Technical Management and R & D.  
Direction and collaboration in more than one hundred studies and projects related to:  
· Cartography and Evaluation of Ecosystems and Natural Resources.  
· Evaluation, Correction and Control of the Environmental Impact of Public Works.  
· Environmental, Territorial and Urban Planning.

01/1995 - 03/1997 **Statistical Office of Andalusia.**

Position Fellow in the Training Plan of the Statistical Staff of the Government of Andalusia.

Main activities and responsibilities Collaboration in the work of the Statistical Unit of the Regional Ministry of Environment (CMA):

- *Drafting of Technical Projects of the Statistical Activities of the CMA.*
- *Development of the Plan for the Exploitation and Statistical Production of Land Use and Vegetation Cover of Andalusia 1.991.*
- *Control of reception of Forest Statistics.*

07/1987 - 01/1989 **Department of Ecology. University of Seville.**

Position Research Fellow and Collaborator.

Main activities and responsibilities Ecological researches in salt marsh vegetation.  
Applied studies of ecology for some civil projects and planning.  
· *Environmental Impact Assessment of the marine farm project, Veta de La Palma. Pre-Park North of National Park of Doñana. (Agropecuaria del Guadalquivir, S.A.).*  
· *Study of Environmental Impact of the transformation project of the Subzone West of the Irrigation Zone of Chanza. (INCISA).*  
· *Ecological study for the management of aquaculture in the marshes of Guadiana, Carreras and Piedras. (TEMA, Taller de Ecología y Medio Ambiente).*

## + UNIVERSITY EDUCATION

2016 - 2017	<b>MSc in DATA SCIENCE &amp; BIG DATA.</b> University of Seville.	<b>EQF 7</b>
1989 - 1993	<b>BSc in STATISTICS.</b> University of Seville.	<b>EQF 6</b>
1982 - 1987	<b>MSc in BIOLOGY.</b> University of Seville.	<b>EQF 7</b>

## + COURSES

09/2018 - 12/2018	<b>Higher Course for ICT Sector's Directors.</b> 100h. Corporate Campus of the Andalusian ICT Sector. Government of Andalusia. School of Industrial Organization (EOI). Seville.
10/2015	<b>Human Resources.</b> 4h. TYPASA. Sevilla.
03/2011	<b>Training in ArcGIS Server.</b> 15h. ESRI España. Murcia.
05/2005	<b>Processes of capture and processing of data for cartographic production.</b> 4h. ESRI España. Sevilla.
10/1998	<b>The space in ecology.</b> 30h. Menéndez Pelayo International University. Seville.
07/1996	<b>Advanced Statgraphics.</b> 20h. Statistical Office of Andalusia. Sevilla.
03/1996	<b>Researches Design.</b> 10h. Statistical Office of Andalusia. Sevilla.
11/1995	<b>Introduction to Demographic Analysis.</b> 30h. Statistical Office of Andalusia. Sevilla.
05/1995	<b>Graphs &amp; Maps.</b> 15h. Statistical Office of Andalusia. Sevilla.
05/1995	<b>Introduction to SAS.</b> 25h. Statistical Office of Andalusia. Sevilla.
05/1995	<b>Projections of Population of Andalusia.</b> 10h. Statistical Office of Andalusia. Sevilla.

## + LANGUAGES

Mother tongue	<b>Spanish</b>				
Other language(s)					
Common European Framework of Reference for Languages		<b>Understanding</b>		<b>Speaking</b>	
		Listening	Reading	Spoken interaction	Spoken production
	<b>English</b>	B1	B2	B1	B1
	<b>French</b>	B1	B2	B1	B1

## + COMPUTER SKILLS

Operating systems	<b>Linux, UNIX, Windows</b> Extensive experience in managing Linux servers, virtual servers, etc.
Desktop GIS	<b>QGIS, ArcGIS - Arc/Info, Arcview, GRASS, GvSIG</b> Advanced user. Trainer.
GIS Servers	<b>Geoserver, ArcGIS Server, UMN Mapserver, Geonetwork</b> Extensive experience in the management of Geoserver.
GIS Libraries	<b>OpenLayers, GeoExt, Leaflet, GDAL/OGR, Proj4, JTS, Geotools</b> Extensive experience in webgis development with OL, GeoExt, Leaflet.
DBMS & Big Data	<b>PostgreSQL - Postgis, Oracle - Spatial, SQLite - SpatiaLite, SQL Server, Neo4J, MongoDB, Hadoop, Spark</b> Extensive experience in administration of BD servers, mainly PostgreSQL.
Statistics & Data Science	<b>R, SPSS, H2O, Weka, SciKit Learn</b> Advanced habitual user, mainly with R.
General languages	<b>JavaScript, SQL, Java, Python, C#, VB, Avenue, AML, C, Lisp</b> Extensive experience in development, mainly web, with JS, SQL and Java.
Methodologies, Specifications and Tools for Developing	<b>Métrica 3, Madeja, Scrum, OGC Spec, INSPIRE</b> <b>UML, Enterprise Architect, Moskitt</b> <b>Maven, Ant, Anaconda, Git, Subversion, Bazaar, Docker</b> <b>R Studio, Netbeans IDE, Jupyter, PyCharm, Eclipse IDE, Visual Studio</b> Experience with methodologies and regular user of tools, mainly RStudio, Netbeans, svn and bazaar on own servers and Git with Bitbucket and GitHub.
Project management	<b>Redmine, MS-Project</b> Extensive experience in managing Redmine servers and developing plugins (RoR). Regular user.
Others	<b>Autocad, Revit, LibreOffice, MS-Office, Odoo (Open ERP)</b>

## + TEACHING

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- 2009-03-30 **"Introduction to gvSIG"** (8h). TYPsa. Sevilla.
- 04/2004 **"Integrated Analysis of Spatial Data and Attributes"** (4h). Course: GIS as a Tool of Management in Agricultural Sector. EOI – ASAJA. Seville, 2003 and 2004.
- 04/2003 **"Spectral features of the earth surface"** (4h). Course: GIS as a Tool of Management in Agricultural Sector. EOI – ASAJA. Seville, 2003.
- 11/2002 **"Vegetation conditioning and correction of landscape and ecological impacts in highways and roads"** (4h). Landscape Engineering Course - Control of erosion. Center of Agricultural Research and Training (CIFA) of Palma del Río. Cordoba, 2001 and 2002.
- 11/2001
- 1994-09-01 **"Analysis of the landscape's structure in the environmental impact study of an agrarian transformation project"** (1h). Course on Landscape Assessment in the Environmental Impact Studies and Territorial Planning. Practical experiences. Official College of Biologists. Seville, 1994.

## + PUBLICATIONS

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- 2015 J. Carranza. **SaneaCLM: Information System of Sanitation of Urban Wastewater Treatment in Castilla-La Mancha**. *Corporate Bulletin of TYPsa Group Nº 44*: 45-47. 2015. <https://www.typsa.com/wp-content/uploads/Boletin-44.pdf#page=45>
- 2014 J. Carranza. **Spatial Data Infrastructure of TYPsa Group**. *Corporate Bulletin of TYPsa Group Nº 41*: 87-99. 2014. <https://www.typsa.com/wp-content/uploads/Boletin-41.pdf#page=87>
- 2012 J. Carranza, C. Brieva, M. Copado, S. Bello, A. González-Nicolás, M. Rodríguez. **Brocal: Geographic Information System of Groundwater Quality in the Guadalquivir River Basin**. *VIII Symposium of the Water in Andalusia*. Cádiz. IGME. Serie Hydrogeology and Groundwater 30: 1659-1668. ISBN: 978-84-7840-863-4.
- 2009 J. Carranza. **Brocal System: Geographic Information System of Groundwater Quality in Guadalquivir River Basin**. *Corporate Bulletin of TYPsa Group Nº 27*: 70-72. 2009. <https://www.typsa.com/wp-content/uploads/Boletin-27.pdf#page=70>
- 2007 A. Argüelles, V. Cifuentes, J. Carranza. **WFD & Agriculture: the Pilot River Basin of Guadalquivir**. *V National Congress of Civil Engineering*. Sevilla. 2007. [http://www.ciccp.es/biblio\\_digital/V\\_Congreso/congreso/pdf/0603.pdf](http://www.ciccp.es/biblio_digital/V_Congreso/congreso/pdf/0603.pdf)
- 2007 A. Argüelles, V. Cifuentes, J. Carranza. **Guadalquivir PRB** in *Experiences in Analysis of Pressures and Impacts from Agriculture on Water Resources and Developing a related Programme of Measures. Report of the Pilot River Basin Group on Agriculture, Phase II period September 2005 – December 2006*. Edited by M. Cherlet. Institute for Environment and Sustainability. EUR 22808 EN, ISBN 978-92-79-06228-5. 2007. [http://ec.europa.eu/environment/water/water-framework/pdf/report\\_phase\\_2.pdf](http://ec.europa.eu/environment/water/water-framework/pdf/report_phase_2.pdf)
- 2006 V. Cifuentes, E. Mellado, J. Carranza, J.L. Serrano, A. Carrillo. **WFD and Agriculture: Spatial Data Management in the Guadalquivir Pilot River Basin**. *Workshop "Agriculture and Environment in the Balkans and Turkey Networking Regional Experience"*. Gembloux. 2006.
- 2006 V. Cifuentes, E. Mellado, J. Carranza, J.L. Serrano, A. Carrillo. **Morphological pressures in Guadalquivir River Basin: from the photo-interpretation to the spatial analysis**. *XIII Congress of Spanish Association of Limnology*. Barcelona. 2006. <http://www.tilesa.es/ael2006/01.htm>
- 2002 J. Ruiz, J. Carranza, R. Herrera, E. Gordo, M.A. Ruiz. **Barrier effect on wildlife and correction measures on the A-381 highway**. *V Workdays of Flora, Fauna and Ecology of the Campo de Gibraltar*. Almoraima, 27: 321 – 334. 2002. <http://institutoecg.es/almoraima-27/>
- 2002 M.A. Ruiz, E. Gordo, J. Carranza, J. Ruiz. **Characterization of compensatory measures of the A-381 highway, Jerez-Los Barrios. Actions related to water resources**. *V Workdays of Flora, Fauna and Ecology of the Campo de Gibraltar*. Almoraima, 27:371-377. 2002. <http://institutoecg.es/almoraima-27/>
- 2001 J. Prenda, M. Práxedes, J. Carranza, J. Ruiz. **Ecological characterization of the effects of a fish mortality event in the lower stretch of the Barbate River (Cádiz)**. *Tecnología del Agua* 218: 33-40. ISSN 0211-8173. 2001.
- 1998 **ATLAS OF ANDALUSIA**. Vol. I: General Cartography (1:100.000). Serie Land Uses. Technical assistance in cartography and computing. Government of Andalusia. ISBN 8480951311.
- 1997 J.M. Moreira, A. González, J. Carranza, A. Fernández-Palacios, E. Piñero, J. Ruiz. **Mapping and Statistics of Land Use and Land Cover in Andalusia. Monitoring 1976-1991**. ISBN 84-87294-98-7. Regional Ministry of Environment. Government of Andalusia. 1997.

- 1995 A. González, A. Fernández-Palacios, J.M. Moreira, J. Carranza, J. Ruiz. **The Map of Land Uses and Land Cover of Andalusia and its integration into a program to monitor the changes in the territory.** VI Scientific Meeting of the Spanish Association of Remote Sensing, Valladolid. 1995. <http://www.aet.org.es/?q=vicongreso-cartografia>
- 1993 J. Ruiz, J. Carranza, A. Fernández-Palacios, M. Rodríguez. **The Land Cover Map of Andalusia 1991. Methodological aspects and perspectives.** General Conference on Autonomic Management of Environment. ISBN 84-87294-54-5. Sevilla. Environment Agency of Andalusia. 1993. <http://www.juntadeandalucia.es/servicios/publicaciones/detalle/46350.html>
- 1990 C. Martínez, J. Carranza, J. Ruiz, J. Jiménez-Nieva. **Application of a methodology for the Ecological Evaluation in a Mediterranean environment.** I Congress of Landscape Science. Torrebónica (Barcelona). 1990.
- 1987 E. Figueroa, J. Jiménez-Nieva, J. Carranza, C. González. **Distribution and mineral nutrition of Salicornia ramossissima J. Woods, Salicornia europaea L. y Salicornia dolichostachya Moss. in the estuary of rivers Odiel and Tinto (Huelva, SW España).** Limnética 3(2): 307-310. Spanish Association of Limnology. Madrid. 1987. <http://www.limnetica.net/Limnetica/Limne03/>
- 1987 E. Figueroa, J.M. Fernández-Palacios, J. Carranza, J. Jiménez-Nieva. **Growth trends in populations of Salicornia ramossissima J. Woods.** VIII Biennial of Natural History. Pamplona 1987.

## + MOST RELEVANT RECENT PROJECTS

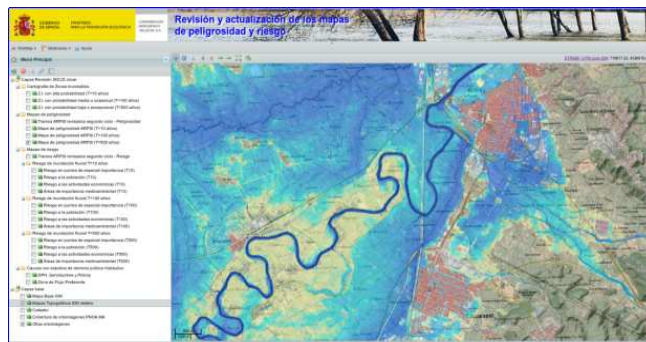
- 2020 **Computer technical assistance in the deployment, management and maintenance of servers, OGC map services and WebGIS viewer for the public exhibition of the review of floodplains of the Júcar River Basin District.**

Recipients TYPESA for Júcar River Basin Authority.

Position Head of project.

Description Los trabajos realizados han consistido resumidamente en:

- Registro de dominio revision-snczi-jucar.es.
- Configuración de Servidor VPS Linux y Despliegue de Aplicaciones Base.
- Configuración de Servidor GIS: Geoserver.
- Publicación de Servicios OGC: WFS / WCS / WMS.
- Adaptación, Despliegue, Configuración y Personalización de Cliente WebGIS Básico.
- Mantenimiento mensual durante trece meses.



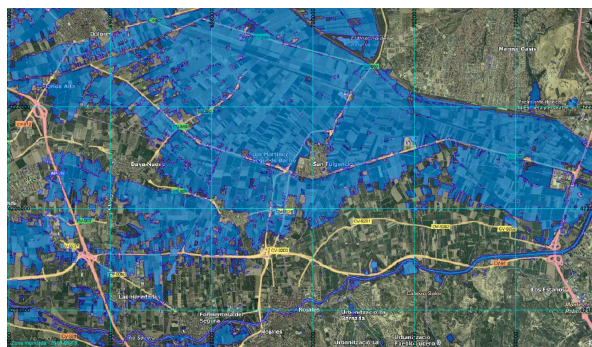
- 2019 **Delineation of the water surface and its evolution after the floods of the September 13, 2019 in Vega Baja of the Segura River using remote sensing techniques.**

Recipients TYPESA

Position Head of project.

Description The work carried out has consisted in summary of:

- Acquisition of COSMO-SkyMed satellite image of 09/14/2019 (StripMap HIMAGE) of the Vega Baja del Río Segura.
- Treatment of 11 images from the Sentinel-1, Sentinel-2, PlanetScope and SkyMed satellites between September 10 and 29 in the Vega Baja del Río Segura (696 Km2), through correction, calculation of indices, thresholding and vectorization of flooded surfaces.
- Report writing.





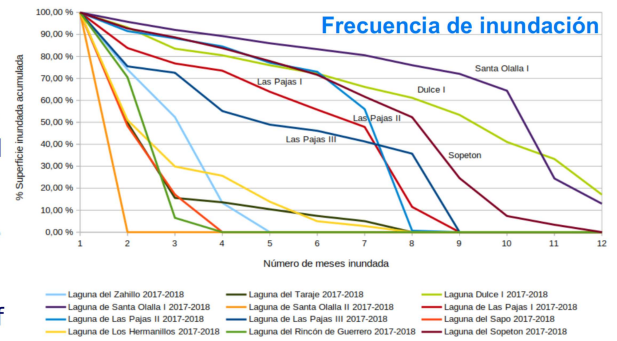
**2019 Study of the evolution of the flooded surface of the Doñana lagoons between November 2017 and November 2018 [CU(PH)-6134].**

**Recipients** Guadalquivir River Basin Authority. Hydrologic Planning Office.

**Position** Head of project.

**Description** The work carried out corresponds to the update, until November 2018, of the series of data to monitor the evolution of the flooded surface and vegetation in the Doñana lake-type water bodies, derived from remote sensing, and more specifically:

- Determination of the frequency of flooding and analysis of the evolution of the extension of the water surface in the study period, from the water index (MNDWI), derived from satellite images and its relationship with the rainfall data .
- Evolution of vegetation from the vegetation index (NDVI) derived from satellite images for the study period.
- Images from the Sentinel 2 satellite have been used, and an image has been selected for each of the months.



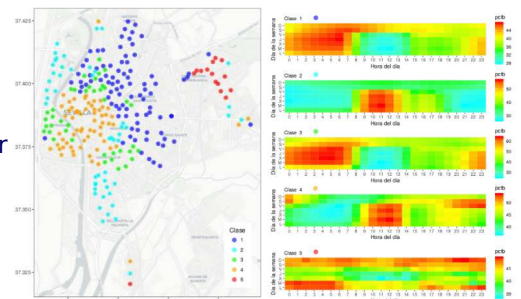
**2018 Smart Bike - Sevilla: Spatio-Temporal Patterns and Predictive Models of the use of Sevici's bicycles.**

**Recipients** University of Seville.

**Position** Author.

**Description** From open data published by the Sevici's management company and compiled by the Universities of Huelva and Seville for a year, the temporal, spatial and spatio-temporal patterns of the use of Sevici's bicycles are identified. The results confirm their effective use as a means of transport (alternative) in daily activities and also, intuit the preferred functional role in the urban structure of the different areas in which the stations are located. Predictive models of the use of bicycles have also been built, for short-range time horizons (15min, 30min, 1h, 4h, 8h and 24h). In total, 1813 models have been estimated, seven for each of the stations, all, regression models with elasticnet regularization. The results of their testing have shown a very good predictive capacity, with RMSE (root mean square error) of 17.6 on average (percentage of available bikes).

<https://bitbucket.org/JeronimoCarranza2/TFM-Sevici>



**2015 SaneaCLM: Information System of Sanitation of Urban Wastewater Treatment in Castilla-La Mancha**

**Recipients** Water Agency of Castilla - La Mancha.

**Position** Head of project.

**Description** In the framework of the project "Control and Diagnosis of Urban Wastewater Treatment Plants in Castilla-La Mancha, 2011-2015", the design, development and implementation of a J2EE software application, called SaneaCLM, has been carried out for the information management of urban wastewater treatment plants (EDAR) and graphical, geographic and alphanumeric exploitation of their structural and analytical data.

SaneaCLM is based on the following technologies:

- BD: Microsoft SQL Server 2008 R2
- Frameworks J2EE: (Backend: Hibernate, Spring, Jackson y Frontend: JSP, ExtJS and OpenLayers)
- Report Server: BIRT
- GIS Server: OGC-WMS (ArcGIS Server, Geoserver)



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## 2014 Development and Implementation of a Geographical Information System of the Ewaso Ng'iro South River Basin

**Recipients** Government of Kenya. Ministry of Regional Development Authorities (MoRDA).

**Position** Technical Coordinator.

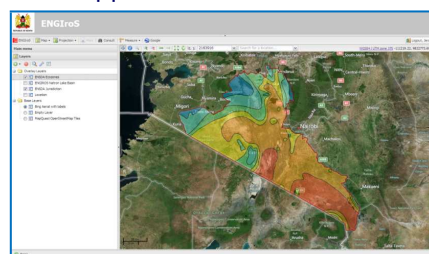
**Description** The project aims at the design, development and implementation of a corporate Geographic Information System of the Regional Development Authority of Ewaso Ng'iro South (ENSDA), with destination in the Office of the Headquarters of the ENSDA in Narok. Support and installation of all necessary software and hardware is provided. The activities developed include:

1. Analysis and Design
  - Analysis of the existing situation
  - Definition of GIS requirements
  - Design of the data model
2. Development of the GIS
  - Data collection
  - Transformation and Load in the database
  - Development of specific WebGIS application

3. Implantation and Training
4. Technical support

The technologies used include:

- BD: PostgreSQL 9.2 – PostGIS 2.0
- GIS Server: Geoserver 2.2 / Geonetwork 2.4
- WebGIS: ExtJS and OpenLayers
- Desktop GIS: ArcGIS Desktop 10 and QGIS 2.8



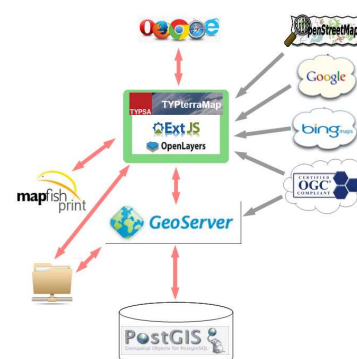
## 2014 Spatial Data Infrastructure of TYPESA Group.

**Recipients** TYPESA Group.

**Position** Head of project.

**Description** The Spatial Data Infrastructure of TYPESA Group (IDETypsa) is an R+D+i project developed by the Department of Territorial Information of Andalusia that aims to increase the efficiency in the access, use, exploitation and dissemination of geographic information within the Group. IDETypsa has been developed entirely with open source free software components, among others:

- BD: PostgreSQL – PostGIS
- GIS Server: Geoserver
- Print Server: MapFishPrint
- WebGIS Client: TYPTerraMap with ExtJS and OpenLayers



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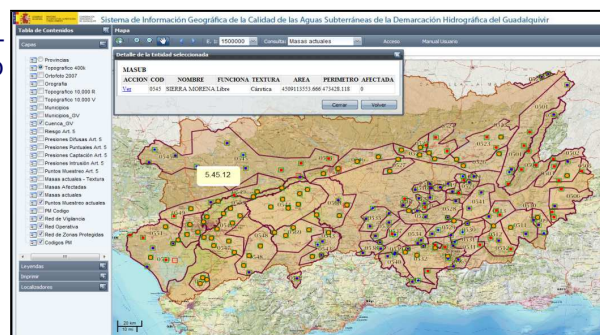
## 2011 Geographic Information System of Groundwater Quality in the Guadalquivir River.

**Recipients** Guadalquivir River Basin Authority.

**Position** Head of project.

**Description** In the framework of the project of exploitation of the quality control network of the groundwater of the Guadalquivir Basin was developed the Brocal system. It is a Geographic Information System in a web environment that supports both information management tasks and its alphanumeric, graphic and geographic exploitation. Brocal is integrated by a Java application (J2EE) with three-layer architecture and webgis client, an OGC map server and a database with spatial support:

- BD: Oracle
- GIS Server GIS: Geoserver
- Print Server: MapFishPrint
- Report Server: JasperReports
- App J2EE Frameworks: ExtJS, OpenLayers, JSF-RichFace, Spring, JPA-EclipseLink.



<https://www.typsa.com/wp-content/uploads/Boletin-27.pdf#page=70>

**PROVISION OF INFORMATION ON VARIOUS STATISTICAL ACTIVITIES OF THE P.E.C.A. 2013-2020. Lot 3. Databases of the registry entries of the Andalusian Societies, December 2018 / January 2021.** Institute of Statistics and Cartography of Andalusia. (In progress).

**Computer Technical Assistance for updating and digitizing the technical files of thirteen state-owned dams of the Júcar River Basin.** TYPESA for the Júcar River Basin Authority. (In progress).

**Computer Technical Assistance for the creation of the Catalog of hydraulic sanitation infrastructures and implementation of a computer application for the definition of urban agglomerations and preparation of the third sanitation plan of the Comunitat Valenciana.** TYPESA for the Department of Agriculture, Rural Development, Climate Emergencies and Ecological Transition. Generalitat Valenciana. (In progress).

**Analysis, design and development of the database and query application of Industrial Zones in the Júcar River Basin.** TYPESA for the Júcar River Basin Authority, 2019.

**Data update in the GIS J2EE Rustic3A application, on two servers; TYPESA office in Seville and Andalusian Agency for the Environment and Water in Huelva.** TYPESA for Andalusian Agency for the Environment and Water, 2019.

**Technical assistance in the development of the general aspects related to Geographic Information Systems in the Hydrological Plan offers of the Ministry of Ecological Transition.** TYPESA, 2019.

**Environmental technical assistance in the development of surveillance and inspection offers for dams in the hydrographic demarcations of the Andalusian intra-community basins.** TYPESA, 2018.

**Computer technical assistance for the adaptation and configuration of the J2EE application, SaneaCLM, for its deployment in production on the servers of the ICT Service Center of the Junta de Castilla - La Mancha.** TYPESA for the Castilla - La Mancha Water Agency, 2018.

**Installation, configuration and deployment of the GIS J2EE application, Rustic3A, on two servers; one at the TYPESA office in Seville and the other at the Andalusian Environment and Water Agency office in Huelva.** TYPESA for Andalusian Agency for the Environment and Water, 2016.

**Lower Ewaso Ng'iro South Multipurpose Development Project (LENSDEP): Study of Environmental Flows.** Ministry of Regional Development Authorities (MoRDA), Kenya. 2014.

**Analysis, design and development of a database application of Biological Water Quality of the reservoirs and lakes of the Duero Basin.** Tecnomá, S.A. for the Duero Basin Authority. 2011.

**Geographic Information System of the Environmental Assessment of the Railway Corridor of the Costa del Sol.** Tecnomá, S.A. for Infrastructure Manager Agency of Andalusia. 2011.

**Inventory and registration of the Andalusian Water Agency rural land plots in Huelva. Development of Rustic3a System.** Andalusian Water Agency. 2011.

**Integration and coordination of flood studies in Andalusia.** Andalusian Water Agency. 2010.

**Update and integration of socio-hydrological information database.** Guadiana Basin Authority. 2010.

**Information System of Sanitation and Urban Wastewater Treatment in Andalusia (Sanea).** Andalusian Water Agency. 2010.

**Standardize the Statistic Activity Technical Projects of the Department of Environment of the Andalusian Administration.** EGMASA. 2009.

**Map data correction of 2.882 hunting reserves of the provinces of Almería, Cádiz, Huelva, and Málaga.** EGMASA. 2009.

**Information Management and Integration in the project of Design and Evaluation of Continental Waters Quality in Andalusia.** Andalusian Water Agency. 2009.

**Eco cartography study of the North Coast of Grand Canary Island (Las Palmas).** Ministry of Environment. 2008.

**Statistical summary of natural flow in the Guadalquivir river basin in the period 1940 - 2006 and allocation to hydrographical network.** Guadalquivir Basin Authority. 2008.

**Environmental impact assessment of agri-environmental measures for rural development in Andalusia main agricultural areas.** EC - Joint Research Centre - Institute for Environment and Sustainability. Ispra. 2007.

**Technical Assistance to the Public Works Directorate in updating the National Transport Plan of Mauritania. GIS database and statistics services.** Rep. Islamic of Mauritania - EC Delegation in Mauritania. 2007.

**Technical Assistance to the Guadalquivir Basin Authority as European Pilot River Basin in the second phase of implementation of the Water Framework Directive.** Guadalquivir Basin Authority. 2007.

**Continuation of the works derived from the implementation of the Water Framework Directive.** Guadiana Basin Authority. 2006.



**Correction of the geographical information layer of the hydrographic network of the Guadiana Basin.** Guadiana Basin Authority. 2006.

**Water Framework Directive implementation in the Guadalquivir Basin at 2004 horizon.** Guadalquivir Basin Authority. 2006.

**Validation and Exploitation of alphanumeric data of Monitoring Networks.** Guadiana Basin Authority. 2004.

**Automation of spatial and statistical processes in the GIS of Guadiana Planning Office.** Guadiana Basin Authority. 2003.

**Compression of digital image files and load of alphanumeric databases to the GIS of the Office of Hydrological Planning .** Guadiana Basin Authority. 2003.

**Debugging of the geographic information layers of the Office of Hydrological Planning for the internal consultation network.** Guadiana Basin Authority. 2004.

**Visitor's statistics in Natural Protected Areas of Andalusia. Pilot Study in Doñana.** Regional Ministry of Environment. Government of Andalusia. 2002.

**Integration of Taxonomy Information in Land Cover Map for some Natural Protected Areas of Andalusia.** Regional Ministry of Environment. Government of Andalusia. 2002.

**Environmental monitoring of the Andévalo Dam works.** Guadiana Basin Authority. 2002.

**Manual of environmental prevention procedures in the field of activities of the Guadiana Basin Authority.** Guadiana Basin Authority. 2002.

## + OTHERS RELEVANT PROJECTS

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### **Geographic Information Systems, Cartography and Data Processing:**

*UPDATE, STATISTICAL EXPLOITATION AND VALIDATION OF THE CARTOGRAPHY OF LAND USES AND LAND COVER IN ANDALUSIA TO THE YEAR 1.999.* Regional Ministry of Environment. Government of Andalusia. 2000.

*DIGITIZATION AND LOAD TO DATA BASE OF THE SHEETS E. 1: 50.000 OF THE MAP OF LAND COVER OF ANDALUSIA.* Regional Ministry of Environment. Government of Andalusia. 1999.

*ADJUSTMENT OF THE MAP OF LAND COVER OF ANDALUSIA TO THE ORTHOIMAGE SPOT-PAN. E. 1: 50,000.* Regional Ministry of Environment. Government of Andalusia. 1998.

*DESIGN AND PRODUCTION OF A MAP OF VEGETATION AND FOREST RESOURCES OF ANDALUSIA FROM THE FOREST MAP OF SPAIN.* Regional Ministry of Environment. Government of Andalusia. 1998.

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- Lagunas de Cádiz Natural Reserves (Lagoons).
- Fuente de Piedra Lagoon/Saline Natural Reserve.
- La Breña y Marismas del Barbate Natural Park (Mountains and Marshes).
- Marismas del Odiel Marshes Natural Reserve.

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