



Pau Juan-García

Senior Consultant



PROFESSION

Scientist

PROFESSIONAL ASSOCIATIONS

C. WEM

QUALIFICATIONS

BSc, MSc, PhD (Hons)

JOINED ATKINSRÉALIS

2015

NATIONALITY / LANGUAGES

Spanish / Spanish, English,
Catalan, French, Chinese

PROFILE

Pau is a Senior Consultant in the Strategic Advisory Services (SAS) Research team in the Water Management Consultancy group at AtkinsRéalis. Pau is a Doctor in Water Science and Technology and has over nine years of experience in the water and environment sector.

Pau's background is in environmental science with a Masters in environmental engineering. He is a chartered environmental manager with CIWEM and has been in the scientific committee of various international conferences and authored several peer reviewed publications. His areas of expertise include water quality and wastewater process modelling, resilience, data analysis, GIS and programming. He is particularly interested in operations research to support decision making in water management. Pau has acted as the Project Information Manager for various projects in Atkins, where he oversaw data storage, cleaning, processing, and analysis.

KEY EXPERIENCE

- Water Quality Modelling
- Data analysis and visualisation
- Software development (Python, C#, R, ArcGIS)
- Optimisation analysis
- Resilience
- Geospatial analysis

**EXPERIENCE WITH
ATKINSRÉALIS
(2015 - 2023)**

- **2023 Wessex Water AMP8 SAGIS support (secondment)**
As part of this project, I was seconded to Wessex Water for 9 months. During this time, I lead my team to carry out a series studies, including the analysis for several Environment Agency drivers: 'no deterioration', 'dry-weather flow exceedance' and LTracS and SSSI nutrient neutrality. I also studied the effects of climate change on these drivers and provided training in SAGIS to the company's employees.
- **2023 South Staffs CEE Climate change analysis (technical specialist)**
I was a technical specialist on this study for South Staffs that designed a new methodology to assess the effects of climate change on abstractions
- **2023 South East Water Broad Oak reservoir study (technical specialist)**
I was a technical specialist to carry out a scoping study of water quality pressures and design of a water quality sampling campaign for the scoping and design of the Broad Oak reservoir.
- **2023 A pollution inventory tool for the Irish (technical specialist)**
I was the lead expert on setting up UKWIR's Pollution Inventory tool for Irish Water to be used for reporting to the European Pollutant Release and Transfer Register.
- **2023 United Utilities Tabley Mere water quality study (water quality modeller)**
I was the lead expert in a SAGIS modelling study to assess the effect of a CSO to the Tabley Mere Lake for United Utilities.
- **2023 United Utilities North-West Transfer Modelling (water quality modeller)**
I was a technical expert assisting in a SAGIS modelling study to assess the effect on water quality of the abstractions pertaining to the North-West Transfer project in United Utilities.
- **2022 Welsh Water SAGIS modelling upgrade (project manager)**
I was the project manager in a water quality review of the SAGIS models for the River Tywi, Eden, Gwyrfai and Meirionnydd Oakwoods.
- **2022-2023 SIMCAT scoping (technical specialist)**
Technical expert in a project to identify and appraise potential options for the ongoing management of the SIMCAT codebase. I carried out a desk-based study of open-source management practices, and a comparison of approaches adopted for other relatable software tools. In a second stage of this project funded directly by the Environment Agency I provided a recommendation to make SIMCAT open source.
- **2021-2022 Environment Agency – Coastal modelling**
This project for the Environment Agency consists of a series of modelling studies for the Taw-Torridge, Penzance and Bude areas, using the "State of the nation" methodology coined by the Environment Agency. My role consisted of designing the implementation of said methodology and carrying it out using Python, MIKE21, SWAN, XBeach and other modelling tools.
- **2021-2022 Wessex water modelling support for rCSMG (water quality modeller)**
Water quality modeller in study of phosphorus sources to identify the discharge permit criteria required to address DCWW's estimated 'fair share'. Key tasks

include updating, designing scenarios, and calibrating the Wessex Water's water quality models. Other tasks include supporting Wessex Water in the undertaking of further simulation work.

- **2021-2022, UKWIR, Pollution Inventory Tool (Project manager and technical specialist)**

The objectives of this project were threefold: i) to provide an updated and revised version of the Pollution Inventory estimator tool to generate e-PRTR estimates of suitable credibility to regulators; ii) to demonstrate that the companies are using the best available information to support the requirements of regulators, and that this is provided on a consistent and comparable basis across the sector; and iii) to scope alternative platforms for the tool in future.
- **2021 Thames Water, Chalgrove STW (water quality modeller)**

Preparation of the solution development to Thames Water's Approval AMP7 Non-Infrastructure (NI) Project for the Chalgrove wastewater treatment works. I was the lead scientist and modeller in a study to assess the anticipated growth and to ensure the Water Framework Directive (WFD) requirements do not cause deterioration or prevent future improvement works to the Haseley Brook.
- **2021 Thames Water, SESRO (data engineer, modeller)**

Use of SAGIS-SIMCAT to undertake modelling for the planned South East Strategic Reservoir Option (SESRO) in Oxfordshire. The purpose of the SAGIS modelling is to assess the impact of the scheme on WFD compliance in the River Thames and risks to drinking water at downstream water treatment works.
- **2021 UKWIR, Fair Share (project manager and technical specialist)**

The aim of this project was to provide the water industry with the capability to rapidly undertake pollution allocation evaluations using SAGIS outputs. I helped design and tested an analysis tool that can rapidly evaluate the implications of different interpretations (or variations) of the Polluter Pays methodologies, at a variety of spatial scales, and for a range of determinands and supported the transfer of knowledge from the study to the wider SAGIS user community.
- **2021 UKWIR, SAGIS Support contract (lead software developer, modeller)**

Software developer in the maintenance and support of the SAGIS water quality simulation tool. The Source Apportionment Geographical Information System (SAGIS) is a digital information management and visualisation platform embedded within ArcGIS. In combination with the SIMCAT, SAGIS is used by Water Companies to support decision making as part of the Asset Management Planning (AMP) cycle process, and by Regulators for River Basin Management Planning. SAGIS is firmly established within the Water Industry's 'business-as-usual' planning practices. In the recent round of business planning for PR19, SAGIS outputs have served as a key evidence base for identifying wastewater treatment works requiring schemes to further control discharge quality. This support contract includes the development of new tools and functionality, as well as independent pieces of work such as creating a layer of targets and orthophosphate standards, and the development of scripts and data analysis to support SAGIS work.
- **2021 UKWIR, Chemical Investigation Programme (data analyst)**

I was responsible for the data analysis of water quality data samples across all water companies through Great Britain. The UKWIR Chemical Investigations Programme (CIP) is an ongoing research programme that addresses the likely

implications of environmental legislation for the UK water industry. It has primarily been addressing the consequences of legislation relating to trace substances in the water environment. It is coordinated by UK Water Industry Research as a collaborative programme involving the ten water companies in England and Wales.

- **2020-2021 EA AMR (geospatial data analyst)**
Relevant AMR datasets were identified within a recent EA/Defra report 'Framework for understanding environmental antimicrobial resistance in England'. I located and compiled selected datasets on sources of AMR into the environment into a structure of geodatabases. These data will be a foundation of further efforts on AMR. This project is a step towards the development of an understanding of the hazard characterisation of AMR in the environment. The overarching aim of the work is to bring together various datasets about potential sources of AMR in the environment into one database, as an easy-to-access resource.
- **2020 Anglian Water CSMG Investigations (water quality modeller)**
I modelled and designed measures to help achieve CSMG targets and favourable status in the catchment. The investigations followed a Judicial River and Consent Order that requires that the Environment Agency and Natural England to assess Natura 2000 sites and identify the measures necessary to achieve protected area objectives.
- **2020 SAGIS Climate change tool (technical specialist)**
Participated in the design and testing of a climate change and sensitivity analysis tool that enabled water companies and regulators to explicitly include climate change considerations in SAGIS-SIMCAT catchment and asset management planning applications.
- **2020-2021 Wessex water modelling support for PR24 (water quality modeller)**
I identified the discharge permit criteria required to address DCWW's estimated 'fair share'. Key tasks included updating, designing scenarios, and calibrating Wessex Water's SAGIS models. Other tasks include supporting Wessex Water in the undertaking of further simulation work.
- **2020 CDF-SW - DCS modelling - Taw Torridge (technical specialist)**
Working with the Environment Agency, I developed in-house tools to carry out the "State of the Nation" methodology for Coastal Modelling. This consists of a series of Python scripts that automate wave simulations in SWAN and MIKE21, as well as curve fitting to extrapolate simulation results to similar areas.
- **2019-2020 Clwyd SAGIS catchment investigation (water quality modeller)**
I applied a scenario modelling approach using the SAGIS-SIMCAT system to simulate the extent to which controls of phosphorous inputs from DCWW's assets might mitigate the risk of non-compliance within the Clwyd catchment and address DCWW's 'fair share'.
- **2019-2020 Upgrade of SAGIS Model Code (software developer)**
Software developer is key project for the water industry to migrate the SAGIS codebase to ArcGIS Pro. SAGIS was 'written' in VBA, which ceased to be available in newer versions of ArcGIS. This project created the new ESRI Add-In to install SAGIS in ArcGIS Pro using Python.

- **2018-2020 Extending and updating UKWIR's source apportionment tool; UKWIR, SEPA and Environment Agency (water quality modeller)**
 Technical specialist responsible for the data analysis and appraisal of the update of the SAGIS-SIMCAT model to include faecal matter indicator organism (FIO) as a determinand and assess the capability of using SAGIS for FIO mitigation and decision making.
- **2018 Enhancing the Scottish SAGIS modelling platform, UKWIR and SEPA (water quality modeller)**
 Technical specialist in the inclusion of lakes and reservoirs into SEPA's SAGIS models so that this offers an integrated catchment planning system.
- **2018 Extending and Updating UKWIR's SAGIS-SIMCAT decision support tool (software developer)**
 Main software developer in project to expand SAGIS to include diffuse sources of pollution. The DST is an optimisation tool for water management built on top of the water quality modelling system SAGIS-SIMCAT.
- **2018 Extending and Updating UKWIR's source apportionment toolset (technical specialist)**
 Technical specialist assisting on the deployment of a SAGIS-SIMCAT data analysis tool, consisting of an analytical methodology for detecting systematic bias and quantifying uncertainty in SAGIS input data. I developed said methodology in a Python modelling platform.
- **2018 Climate Change Adaptation and Resilient Cities: A Streamlined Approach for the Assessment of the Contribution to Climate Action for Multi-Sector Framework Loans (data analyst)**
 Technical specialist to provide support on the data analysis of the European Investment Bank (EIB) Framework loan database. The analysis included identification of trends and production of summary statistics and a range of charts, figures, and visualisations.
- **2015-2018 Resilience of wastewater treatment to stress conditions. Marie Curie PhD grant (research scientist)**
 Researcher and PhD candidate at TreatRec, a Marie Skłodowska-Curie Action European Industrial Doctorate program. The project arises from the collaboration between Academia (University of Girona, ICRA) and Industry (Atkins). The outputs include various publications and a PhD thesis to review resilience theory applied to wastewater treatment, and a framework for model-based resilience assessment and energy audit of STW using state of the art process modelling.