MINISTERIO DE CIENCIA E INNOVACIÓN

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Plan de Recuperación, Transformación y Resiliencia

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

CV date	03/2024

Part A. PERSONAL INFORMATION

First name	Rafael		
Family name	Pimentel Leiva		
Gender (*)	Hombre	Birth date (dd/mm/yyyy)	06/02/1986
ID number			
e-mail	rpimentel@uco.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-6990-4874		

A.1. Situación profesional actual

Position	Associate Professor		
Initial date	01/05/2023		
Institution	University of Cordoba (UCO)		
Department/Center	Agronomía-DAUCO. Ud. María Maeztu. ETSI Agrónomos y Montes		
Country	Spain	Teleph. number	+34 957 212 662
Key words	Hydrology, Snow, Water Resources, Remote Sensing, Data Assimilation		

A.2. Previous positions

Period	*Position/Institution/Country/Interruption cause*
May 2023 – Aug 2023	Postdoctoral / UCO / Spain
May 2020 – Apr 2023	Postdoctoral Juan de la Cierva – Incorporation / UCO / Spain
Oct 2018 – Apr 2020	Postdoctoral / UCO / Spain
Aug 2016 – Sep 2018	Postdoctoral / SMHI / Sweden
Jan 2015 – Jul 2016	Postdoctoral / UCO / Spain
Jul 2010 – Dec 2014	Predoctoral / UGR / Spain

A.3. Education

PhD, Licensed, Graduate	*University/Country*	*Year*
PhD Civil Engineer	Córdoba, Granada, Málaga / Spain	2014
Environmental Hydraulics (MEng)	Córdoba, Granada, Málaga / Spain	2011

Part B. CV SUMMARY

After finishing my studies as a Civil Engineer (2010, UGR) I obtained a research training grant at the Environmental Dynamics Group (UGR), to study the dynamics of snow in Mediterranean environments using terrestrial photographs, a task that I combined in the 2010-11 academic year with the master's degree in Environmental Hydraulics (UGR-UCO-UMA). I studied the speciality of Integrated Watershed Management (UCO), doing a mobility for 5 months in Cordoba. In October 2011 I started my doctoral thesis at the UGR, in the PhD programme Biogeochemical Flux Dynamics and its Applications, focused on the study of the implications of microrelief in the distribution of snow cover, combining hydrological modelling and remote information. In July 2012, I made my first international mobility participating in a workshop at the University of Twente (The Netherlands) on assimilation techniques. Following this course, in 2013 I spent 3 months at the University of Twente, in the Department of Water Resources, led by Prof. Bob Su, an international reference in the observation of water and energy flows using satellite information. Throughout this period I combined my thesis with participation in various UGR projects related to the study of snow cover, carrying out numerous field campaigns for installation and maintenance of equipment and measurement of snow properties. n the 2013-14 academic year, I started teaching (2.5 ECTS) in the master's course Atmospheric Dynamics

(UGR). I also complemented my training with another international mobility for the Hydrocourse at the Gabriel Lipmman Centre (Belbaux, Luxembourg). In December 2014 I defended my doctoral thesis with international mention and outstanding cum laude qualification, with 8 participations in international conferences, 3 indexed publications and 3 articles in high impact journals. After obtaining my PhD degree I moved to the UCO, to the Fluvial Dynamics and Hydrology Group (GDFH), coordinated by my thesis co-director, where since 2015 I joined research projects analysing the hydrological impact of global warming in Mediterranean mountain areas and the associated ecosystem services. I participated as a lecturer in a course on Hydrological Applications of GIS and as an Honorary Collaborator in the Department of Agronomy teaching undergraduate and master's degree courses. I co-directed my first TFM and started the co-supervision of my first doctoral thesis. I also started to participate in science outreach activities (Science Walk, European Research Night). In 2016, all this activity led me to the accreditation of Assistant Professor Doctor. In spring 2016, I was awarded a 2-year postdoctoral contract in a competitive process with more than 60 candidates at the Hydrology Group of the Swedish Institute of Meteorology and Hydrology (FoUh-SMHI), led by Prof. Arheimer, current president of the IAHS. My main role was the implementation of the HYPE hydrological model at global scale, the first of its kind working at such a scale, which was subsequently transferred to Copernicus Climate Change as a hydrological model for their global service. In addition, my previous experience allowed me to be involved in 6 other international projects. I also continued to collaborate with the UCO and to work as a thesis co-author. 4 articles were published in high impact journals. After these two years, I received an offer as a civil servant at SMHI, which I declined due to the option of consolidation at UCO, where I returned in October 2018. I obtained my first project as PI, SIERRA, in the Andalusia ERDF Operational Programme 2014-2020 call. I led two WP in two European projects (AQUACLEW and CLARA) in the context of co-development of climate services in the water sector. In autumn 2019 the first thesis I co-directed was defended. Since May 2020 I have been a Juan de la Cierva contract holder - Incorporation. Since my reinstatement, I have been involved in teaching activities in undergraduate and master's degree courses related to hydrology and water resources management. I have supervised 8 TFM, 2 TFG, and I am currently co-directing 3 doctoral theses, one of them as principal supervisor. I have been coordinator (2019; 2021) of a summer course on humidity monitoring with remote sensors funded by CeiA3. I am reviewer of scientific journals of impact in the field of hydrology, member of IAHS, IAHR and EGU, where I have been organizing a session at their annual congress for 8 years and since 2022 I am Chair of the Remote Sensing and Data Assimilation Subdivision. Since 2021, I am accredited as Associate Professor. Since my return, I am also the representative of the GDFH in the international networks INARCH and GEOMountains. I am developing three transfer contracts as PI and until February 2022 I have coordinated the dissemination actions in the group. In January 2023 I obtained the i3 certification that has allowed me to benefit from the Stabilisation Plan of the UCO, consolidating me as Associate Professor since September 2023.

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications *(see instructions)*

[1] Ma Y., He, T., Aguilar, C., **Pimentel, R.,** Liang, S., McVicar, T., Hao, D., Xiao, X., Liu, X. 2024. Evaluating Topographic Effects on Kilometer-Scale Satellite Downward Shortwave Radiation Products: A Case Study in Mid-Latitude Mountains. IEEE Transactions on Geoscience and Remote Sensing, 62: 1-16. https://doi.org/10.1109/TGRS.2024.3365865 (Q1: 4/34) IF: 8.2

[2] Contreras, E., Jurazo-Ezqueta, M., **Pimentel, R**., Serrano, L., Hidalgo, C., Jiménez, A., Polo, M.J. 2024. Assessment of seasonal and annual patterns in phosphorus content in a monitored catchment through a partitioning approach based on hydrometeorological data. Environmental Research, 242: 117501. https://doi.org/10.1016/j.envres.2023.117501 (Q1: 32/275) IF: 8.3

[3] **Pimentel, R.,** Chrochemore, L., Andersson, J.C.M., Arheimer, B. 2023. Assessing robustness in global hydrological predictions by comparing modelling and Earth observations. Hydrological Sciences Journal, 68(16): 2357-2372. https://doi.org/10.1080/02626667.2023.2267544. (Q2: 37/103) IF:3.5

[4] **Pimentel, R.,** Arheimer, B., Crochemore, L., Andersson, J.C.M, Pechlivanidis, I., Gustafsson, D. (**1**/6) 2023. Which Potential Evapotranspiration Formula to Use in Hydrological Modeling World-Wide? *Water Resources Research*, 59(5), 033447. https://doi.org/10.1029/2022WR033447 (D1: 14/103), IF: 5,4

[5] Torralbo, P., **Pimentel, R.,** Polo, M.J., Notarnicola, C. 2023. Characterizing Snow Dynamics in Semi-Arid Mountain Regions with Multitemporal Sentinel-1 Imagery: A Case Study in the Sierra Nevada, Spain. Remote Sensing, 15(22): 5365. https://doi.org/10.3390/rs15225365. (Q1: 31/202) IF: 5.0

[6] Pastén-Zapata, E. (AC), **Pimentel, R**., Royer-Gaspard, P., et al. (**2**/11) 2022. The effect of weighting hydrological projections based on the robustness of hydrological models under a changing climate. *Journal of Hydrology: Regional Studies*, 41, 101113. https://doi.org/10.1016/j.ejrh.2022.101113 (Q1: 14/124), IF: 5,437

[7] **Pimentel, R. (AC)**, Photiadou, C., Littel, et al. (**1**/9) 2022. Improving the usability of climate services for the water sector: The AQUACLEW experience. *Climate Services*, 28, 100329. https://doi.org/10.1016/j.cliser.2022.100329 (Q1: 65/325), IF: 4.381

[8] Aguilar, C. (AC), **Pimentel, R.,** Polo, M.J. 2021. Two decades of distributed global radiation time series across a mountainous semiarid area (Sierra Nevada, Spain). *Earth. Syst. Sci. Data*, 13(3),1335-1359. https://doi.org/10.5194/essd-13-1335-2021 (Q1: 4/200), IF:11.333

[9] **Pimentel, R. (AC),** Arheimer, B. 2021. Hydrological impacts of a wildfire in a Boreal region: The Västmanland fire 2014 (Sweden). *Sci. Total Environ.*, 756, 143519. https://doi.org/10.1016/j.scitotenv.2020.143519 (Q1:25/274), IF:7.842

[10] Crochemore, L. (AC), Isberg, K., **Pimentel, R.,** Pineda, L., Hasan, A., Arheimer, B. 2020. Lessons learnt from checking the quality of openly accessible river flow data worldwide *Hydrolog. Sci. J.*, 65 (5), 699-711. https://doi.org/10.1080/02626667.2019.1659509 (Q1: 7/98); IF: 3.502

[11] Arheimer, B. (AC), **Pimentel, R.,** Isberg, K., Crochemore, L., Andersson, J.C.M, Hasan, A., Pineda, L. 2020. Global catchment modelling using World-Wide HYPE (WWH), open data, and stepwise parameter estimation, *Hydrol. Earth Syst. Sci.*, 24(2), 35-559. https://doi.org/10.5194/hess-24-535-2020 (Q1: 7/98); IF: 6.45

[12] Polo, M.J. (AC), Herrero, J., **Pimentel, R.,** Pérez-Palazón, M.J. 2019. The Guadalfeo Monitoring Network (Sierra Nevada, Spain): 14 years of measurements to understand the complexity of snow dynamics in semiarid regions. *Earth Syst. Sci. Data*, 11 (1), 393-407. https://doi.org/10.5194/essd-11-393-2019 (Q1: 3/189), IF: 9.612

[13] **Pimentel, R. (AC),** Herrero, J., Polo. M.J. 2017. Quantifying Snow Cover Distribution in Semiarid Regions Combining Satellite and Terrestrial Imagery. *Remote Sens.*, 9(10), 995. https://doi.org/10.3390/rs9100995 (Q2: 8/30), IF: 3.952

[14] **Pimentel, R. (AC),** Herrero, J., Polo. M.J. 2017. Subgrid parameterization of snow distribution at a Mediterranean site using terrestrial photography, *Hydrol. Earth Sys. Sci.*, 21, 805-820. https://doi.org/10.5194/hess-21-805-2017 (Q1:4/90), IF: 4.819

C.2. Congresses

[1] **Pimentel. R.,** Crochemore, L., Andersson, J.C.M., Arheimer, B. Evaluating global hydrological-process modelling beyond river discharge observations. EGU General Assembly 2023. 23-28 abril 2023. Viena (Austria). Presentación Oral

[2] **Pimentel. R.,** Torralbo, P., Aparicio, J., Andreu, A., González-Dugo, M.P., Polo, M.J. Improving the hydrological role of vegetation over Mediterranean mountain areas: the study case of the dehesa ecosystem in Cardeña-Montoro Natural Park (Spain). IAHS Scientific Assembly 2022. 29 mayo – 3 junio 2022. Montpellier (Francia). Presentación Oral.

[3] **Pimentel. R**., Aparicio, J., Torralbo, P., Contreras, E., Moreno-Pérez, F., Aguilar, C., Polo, M.J. Quantifying the role of mixed pixels in snow cover distribution in semiarid regions: A study case in Sierra Mountain (Spain). EGU General Assembly 2022. 23-27 mayo 2022. Viena (Austria). Presentación Oral

[4] **Pimentel, R.**, Pérez-Serrano, P., Torralbo, P., Polo, M.J. Using meteorological information for defining ecohydrological indicators in Mediterranean mountainous areas: application to the piornal of Sierra Nevada (Spain). SnowHydro 2022. 1-4 febrero 2022. Grenoble (Francia). Póster.

[5] **Pimentel, R.**, Pérez-Palazón, M.J., Herrera-Grimaldi, P., Aparicio, J., Torralbo, P., Polo, M.J. Retrieving river flow descriptors for water management under future climate scenarios over complex terrain: combining pan-European and local modeling in Sierra Nevada (Spain). 11th International Workshop on Statistical Hydrology (STAHY2021). 16-17 septiembre 2021. Valencia (España). Presentación Oral.

[6] **Pimentel, R.**, Torralbo, P., Aparicio, J., Pérez-Palazón, M.J., Andreu, A., González-Dugo, M.P., Polo, M.J. Combining remote sensing and hydrological information for improving hydrological

characterization of dehesas in Mediterranean mountain areas: a study case in Cardeña-Montoro Natural Park (Spain). EGU General Assembly 2021. 19-30 abril 2021. Viena (Austria). Presentación Oral.
[7] **Pimentel, R.,** Herrera-Grimaldi, P., Pérez-Palazón, M.J., Torralbo, P., Herrero, J., Polo, M.J. Can climate models represent the snow occurrence in semiarid areas? The example of Sierra Nevada Mountain Range. SnowHydro2020. 28-31 enero 2020. Bolzano (Italia) Presentación Oral.
[8] **Pimentel, R.,** Torralbo, P., Herrero, J., Pérez-Palazón, M.J., Polo, M.J. Assimilation of Fractional Snow Cover in Mediterranean Catchments: Improving Model Performance and Limitation in a Case-Study in Sierra Nevada (Spain). 27th IUGG General Assembly. 8-17 julio 2019 Montreal (Canadá). Presentación Oral.
[9] **Pimentel, R.,** Marín, C., De Gregorio, L., Callegari, M., Pérez-Palazón, M.J., Notarnicola, C., Polo, M.J. 2018. Validating improved-MODIS products from spectral mixture-Landsat snow cover maps in a mountain region in southern Spain. 4th Remote Sensing and Hydrology Symposium. 8-10 mayo 2016 Córdoba (España). Presentación Oral. https://doi.org/10.5194/piahs-380-67-2018
[10] **Pimentel, R.** El cambio climático y los recursos hídricos. Desertización, sequía e inundaciones. 5º Seminario La intergeneracionalidad en octubre: la realidad del cambio climático. 14-16 octubre 2015 Córdoba (España). Conferencia invitada.

C.3. Research projects

[1] PID2021-123235NB-I00. Incorporando la incertidumbre hidrológica y el análisis de riesgos asociado a la operación de infraestructuras hidroeléctricas en cuencas de montaña mediterránea. Ministerio de Ciencia e Innovación. Convocatoria de Proyectos de Generación de Conocimiento 2021. Investigadoras Principales (IPs): M.J. Polo, C. Aguilar (UCO). 01/09/2022-31/08/2025. 123.299,00 €. Investigador.
[2] TED2021-130937A-I00. Incorporando la variabilidad climática y la calidad del agua en la definición de caudales ambientales en cuencas mediterráneas. Ministerio de Ciencia e Innovación. Proyectos de Transición Ecológica y Transición Digital 2021. IP: M.J. Polo (UCO). 01/12/2022-30/11/2024. 87.860,00 €. Investigador
[3] EQC2021-007093-P. Seguimiento ecohidrológico integral de zonas urbanas y periurbanas para diagnóstico, diseño y mejora de espacios sostenibles. 2021. Ministerio de Ciencia e Innovación. Conv. Adquisición de Equipamiento Científico-Técnico. IP: M.J. Polo (UCO). 01/01//2021-31/12/2022. 875.000,00 €. Investigador.
[4] RTI2018-099043-B-I00. (OPERA) Operatividad en la gestión hidrológica bajo condiciones de torrencialidad/sequía de nieve en alta montaña de cuencas semiáridas. Ministerio de Ciencia, Innovación y Universidades. Convocatoria I+D+i 2018 "Retos en la Sociedad". IP: M.J. Polo (UCO). 01/01/2018-30/06/2022. 108.900,00 €. Investigador.
[5] 1265875. SIERRA: Seguimiento hidrológico de la vegetación en montaña mediterránea mediante fusión de sensores Remotos en Andalucía. Programa Operativo FEDER Andalucía 2014-2020. IP: **R. Pimentel** (UCO) 18/09/2017-30/06/2021. 25.424,00 €.
[6] ERA-NET ERA4CS/PCIN-2017-072. AQUACLEW - Advancing QUAlity of CLimate services for European Water. MITECO /UE. Call APCIN linked to EU- ERANET. IP: M.J. Polo (UCO). 18/09/2017-31/12/2020. 95.000,00 €. Co-responsable Paquete Trabajo.
[7] H2020-SC5-2016-2017-730482-1. CLARA-Climate forecast enabled knowledge services. EU. H2020. IP: J.Mysiak (CMCC). 01/06/2017- 30/09/2020. 558.609,78 €. Investigador.
[8] H2020-EO-1-2016-730005, SPACE-O: Space Assisted Water Quality Forecasting Platform for Optimized Decision Making in Water Supply Services. EU. H2020. PI: Ilias Pechlivanidis (SMHI). 10/11/2016-10/11/2018. 2.469.948,75 €. Investigador.
[9] H2020-WATER-2a-2014-641811. IMPREX: IMproving PRedictions and management of hydrological Extremes EU. H2020. PI: Erik Kjellström (SMHI). 01/10/2015-30/09/2019. 7.999.684,00 €. Investigador.
[10] CGL2014-58508-R. SNOWMED- Sistema de seguimiento global de la cubierta de nieve en regiones mediterráneas: análisis de tendencias e implicaciones. MINECO. Retos. PI: M.J. Polo (UCO). 01/01/2015-31/12/2017. 84.700,00 €. Investigador.

C.4. Contracts, technological or transfer merits

[1] Mountain areas in Mediterranean and semiarid regions as early detectors of the potential future climate of snow domains across different latitudes. EURAC-Research. IP: M.J. Polo (UCO). 23/11/2021-24/11/2024. 109.217,08 €
[2] Desarrollo de sistemas low-cost para la monitorización de la densidad y equivalente de agua del manto de nieve en cuencas de montaña. Tecnologías y Servicios Agrarios, S.A. IP: **R. Pimentel** (UCO). 27/07/2021-26/01/2024. 9.680,00 €
[3] Actualización y ampliación de las curvas de gasto del sistema de aforo en el río Poqueira. Endesa Generation SAU. IP: **R. Pimentel** (UCO). 01/04/2021-30/04/2022. 7.690,75 €
Revisión y análisis de masas de agua en los nuevos Planes Hidrológicos. Endesa Generación, S.A. PI: M.J. Polo. 16/07/2019-30/11/2020. 17.757,53 €
[4] C3S_422_Lot1_SMHI. EU. C3S-Copernicus Global Services. IP: B. Arheimer (SMHI). 01/09/2017 - 01/02/2019. 2.543.533,80 €
[5] Service for water indicators in climate change adaptation (SWICCA). Swedish Meteorological and Hydrological Institute. IP: M.J. Polo. 2015-2018. 50.806,00 €
[6] Informe Técnico del Proyecto: Influencia del cambio global en los servicios ecosistémicos asociados a la hidrología en el Parque Nacional de Sierra Nevada (2016). Fundación Biodiversidad. Ministerio de Agricultura, Alimentación y Medio Ambiente.