Curriculum Vitae

Surname	CONTRERAS LÓPEZ
First Name	Sergio
Date of Birth	11th of January 1979 (Jaén, Spain)
Nationality	Spanish
Main Disciplines	Dryland Ecohydrology, Agrohydrology, Remote Sensing, Droughts and Land Degradation Assessment, Water Management and Planning, Water-related Ecosystem Services
Address	FutureWater Paseo Alfonso XIII, 48 30203 Cartagena España Tel: +34 868 071 286 Email: s.contreras@futurewater.es

Academic and Proffesional Interests

Dryland Ecohydrology, Remote Sensing, Droughts and Land Degradation Assessment, Water Management and Planning, Agrohydrology, Water-related Ecosystem Services.

Personal profile - Overview

BSc in Environmental Sciences (2001), M.A.St in Surface Geodynamics (2004), and PhD (2006) at the University of Almeria. Dryland ecohydrologist, and water and drought expert with more than 10 years of career as researcher and consultant in water resources assessment (quantification of water-energy balance), hydrological and water allocation modelling, and geomatic technologies (analysis of satellite and UAV imagery, and Geographic Information Systems). Dr. Contreras studies and quantifies the links and feedbacks between the Hydrosphere (hydrological processes at the land surface), and the Biosphere (structure and functioning of native and agro- and native ecosystems), and their relationship with climate-forcing drivers and human activities at different spatial scales (plot, landscape, regional). He did research stays at different national and international institutions: Spanish National Research Council (CSIC), University of Western Australia, Institute of Applied Mathematics of San Luis (UNSL-CONICET), and Bureau of Economic Geology. Since its joining in FW at 2013 as consulting researcher, Sergio is contributing to a better understanding of drought impacts on the environment and the economy. He leads the infoSequía pilot project focused on the development and testing of a fully-integrated Drought Monitoring-Management System, and the Work Package on “Drought and Innovations” of the EU-H2020 BRIGAID project. He has actively

participated in in many international and Spanish research projects and contracts. Member of the International Association of Hydrogeologists (2000-present).

Educational background

2003 – 2005	PhD Universidad de Almería, Facultad de Ciencias Experimentales, Universidad de Almería Thesis: Estimation of the water balance in semiarid mountainous regions. Application to Sierra de Gador (Almería, SE Spain)
2002 - 2003	MASt Earth Surface Dynamics, Faculty of Experimental Sciences, Universidad de Almeria Subjects: groundwater and environment, recharge in semiarid regions.
1997 - 2001	BSc Environmental Sciences, Universidad de Almeria, España.

Professional experience

2013 - present	Consulting researcher, Expert in Remote Sensing and Drought Management. FutureWater, Cartagena, España.
2010 - 2013	Postdoctoral Researcher (Juan de la Cierva Fellow), Centro de Edafología y Biología Aplicada del Segura – Consejo Superior de Investigaciones Científicas. Murcia, España.
2009 - 2010	Postdoctoral Fellow – Visiting Scientist, Bureau of Economic Geology – The University of Texas at Austin. Texas, EEUU.
2007 - 2008	Postdoctoral Fellow, Instituto de Matemática Aplicada de San Luis - Universidad Nacional de San Luis & CONICET. San Luis, Argentina.
2006 - 2007	Hired Researcher, Estación Experimental de Zonas Áridas (Consejo Superior de Investigaciones Científicas). Almería, España.
2002 - 2006	Predoctoral Fellow, Estación Experimental de Zonas Áridas (Consejo Superior de Investigaciones Científicas). Almería, España.

Language skills

Spanish:	mother tongue
English:	fluent in writing and speech

Computer skills

GIS/Remote Sensing:	ArcGIS, Idrisi, PcRaster, MapWindow, Surfer, Erdas Imagine
System Analysis:	WEAP, AQUATOOL
Programming:	Matlab, Python, R

Research projects and contracts

2018 – 2022	Transforming Weather Water data into value-added Information services for sustainable Growth in Africa (TWIGA). Role: Researcher. Type of project – Funding source: Research and Innovation Action (H2020 Programme) – European Commission.
2017 – 2019	HERramienta para el MANejo integral del Agua (HERMANA). Role: Consultant researcher. Type of project – Funding source: WWSD-PvW - Netherland Enterprise Agency (RVO) & Corporación Autónoma Regional del Valle del Cauca (CVC, Colombia).
2017	Hydrogeological modelling of groundwater discharge to the Mar Menor lagoon. Role: Consultant (project leader). Type of project – Funding source: Private consulting contract - CCRR Arco Sur–Mar Menor
2016 - 2020	BRIdging the GAp for Innovations in Disaster Resilience (BRIGAID). Role: WP leader. Type of project – Funding source: Innovation Action (H2020 Programme) – European Commission.
2015 - 2019	IMproving PRedictions and management of hydrological Extremes (IMPREX). Role: Researcher. Type of project – Funding source: Research and Innovation Action (H2020 Programme) – European Commission.
2014 - 2015	Accounting System for the Segura river and Transfer (ASSET). Role: Research consultant (participant). Type of project – Funding source: Directorate-General for the Environment - European Commission.
2013 - 2016	The GEISEQ project: a toolbox for the surveillance and the efficient management of droughts. Role: Coordinator. Type of project – Funding source: Torres-Quevedo Project, co-funded by FutureWater and the Spanish Ministry of Economy and Innovation.
2010-2014	Sustainable use of irrigation water in the Mediterranean Region (SIRRIMED). Role: Researcher (WP5, Watershed Information Systems). Type of project – Funding source: Collaborative Project (7th Framework Programme) – European Commision.
2009-2011	Mediterranean Intermittent River Management (MIRAGE). Role: Collaborative researcher. Type of project – Funding institution: Specific Targeted Research Project (7th Framework Programme) – European Commision.
2008-2009	Ecological restoration and landscape integration project of the limestone quarries of Sierra Gador (HOLCIM-Spain). Experimental phase. Role: Researcher. Type of project – Funding institution: Research contract - HOLCIM-España Ltd.
2007 - 2011	Land use change in the Rio de la Plata Basin: linking biophysical and human factors to predicts trends, assess impacts, and support viable land-use strategies for the future. Role: Researcher. Type of project – Funding institution: Cooperative Research Network - Interamerican Institute for Global Change Research.
2007 - 2008	Groundwater-fed woodlands in the deserts of Argentina: Understanding their vulnerability to agricultural development. Role: Collaborative researcher. Type of project – Funding institution: Research Grant – National Geographic Society.

2006	Characterization and modelling of hydrological processes and regimes in gauged basins for the prediction in ungauged basins (CANOA). Role: Hired researcher. Type of project – Funding institution: National Research Project – Spanish Ministry of Science and Education.
2003 – 2005	Artificial recharge in semiarid regions. Tracking down of potential sites for intervention (IRASEM). Role: Researcher. Type of Project – Funding institution: Contract project – Water Institute of Andalucia (Regional Agency of Environment, Regional Government of Andalucia).
2002 – 2005	Spatial distribution of the drainage and recharge in semiarid montane regions (RECLISE). Role: Researcher. Type of project – Funding institution: National Research Project – Spanish Ministry of Science and Education.

Additional courses

2015	Analysis and Modelling of Hydrological Resource Systems with AQUATOOL. Polytechnic University of Valencia.
2013	Training course in Matlab. Technical course. Consejo Superior de Investigaciones Científicas.
2012	Training course on 'Regional experiments for land-atmosphere exchanges'. Faculty of Geo-Information Science and Earth Observation (ITC-Univ. of Twente).
2011	Methodologies for using geostatistics in the processing and interpretation of radioisotopic data. Atomic Energy International Agency - Universidad Nacional de San Luis.
2003	Frontiers in Hydrological Sciences for the 21st century. Universidad Internacional Menéndez Pelayo.
2003	ANCLIM: An open software for time series analysis and homogenization. Technical workshop. Universidad de Zaragoza.
1999	Intensive use of groundwater resources: ecological, technological and ethical aspects. Universidad Complutense de Madrid.
1999	Computer tools for environmental sciences: Potential applications. Technical course. Universidad de Almería.

Scientific and Technical production

ResearchID (Thomson Reuters): E-6139-2010; Google Scholar Profile

SCOPUS Author ID: 18036692400; ORCID link

SCOPUS h-factor: 12 (total of cites: 348)

Google Scholar h-factor: 13 (total of cites: 583)

Item	Total of documents
Book and book chapters	11
Scientific articles in peer-reviewed journals	22
Contribution to congresses and conferences	43
Technical, consultancy and academic documents	10

Book chapters and articles in peer-reviewed journals

García-León, D., **Contreras, S.**, Hunink, J.E., Comparison of meteorological and satellite-based drought indices as yield predictors of Spanish cereals. *Agricultural Water Management*, under review.

Luna, L., Miralles, I., Lázaro, R., **Contreras, S.**, Solé-Benet, A., 2017. Effect of soil properties and hydrologic characteristics on plants in a restored calcareous quarry under a transitional arid to semiarid climate. *Ecohydrology* 11, e1896. http://dx.doi.org/10.1002/eco.1896.

Hunink, J.E., Eekhout, J.P.C., de Vente, J., **Contreras, S.**, Droogers, P., Baille, A., 2017. Hydrological modelling using satellite-based crop coefficients: A comparison of methods at the basin scale. *Remote Sensing* 9, 174; http://dx.doi.org/10.3390/rs9020174.

García-Aróstegui, Jiménez-Martínez, J., Baudron, P., Hunink, J.E., **Contreras, S.**, Candela, L., 2016. Las aguas subterráneas en el Campo de Cartagena-Mar Menor. En V.M. León y J.M. Bellido (Eds.) Mar Menor: una laguna singular y sensible. Evaluación científica de su estado. Instituto Español de Oceanografía, Madrid. ISBN: 978-84-95877-55-0.

Romero-Trigueros, C., Nortes, P.A., Alarcón, J.J., Hunink, J.E., Parra, M., **Contreras, S.**, Droogers, P., Nicolás, E., 2016. The effects of saline reclaimed water combined with a deficit irrigation strategy on Citrus physiology as assessed by UAV remote sensing. *Agricultural Water Management* 183, 60-69; http://dx.doi.org/10.1016/j.agwat.2016.09.014.

Jiménez-Martínez, J., García-Aróstegui, J.L., Hunink, J.E., **Contreras, S.**, Baudron, P., Candela, L., 2016. The role of groundwater in highly human-modified hydrosystems: A review of impacts and mitigation options in the Campo de Cartagena-Mar Menor coastal plain (SE Spain). *Environmental Reviews* 24, 377-392; http://dx.doi.org/10.1139/er-2015-0089.

Cantón, Y., Rodríguez-Caballero, E., **Contreras, S.**, Villagarcía, L., Li, X.Y., Solé-Benet, A., Domingo, F., 2016. Vertical and lateral soil moisture patterns on a mediterranean karst hillslope. *Journal of Hydrology and Hydromechanics* 64, 209-2019; http://dx.doi.org/10.1515/johh-2016-0030.

Alcón, F., Martínez-Paz, J.M., **Contreras, S.**, Navarro-Pay, N., 2015. *Caracterización y evaluación de preferencias de desarrollo de los principales espacios naturales del Grupo de Acción Local Campoder*. Asociación para el desarrollo Rural CAMPODER, Murcia. ISBN: 978-84-96396-74-6.

Hunink, J.E., **Contreras, S.**, Soto-García, M., Martín-Gorriz, B., Martínez-Alvarez, V., Baille, A., 2015. Estimating groundwater use patterns of perennial and seasonal crops in a Mediterranean irrigation scheme, using remote sensing. *Agricultural Water Management* 162, 47-56; http://dx.doi.org/10.1016/j.agwat.2015.08.003.

Contreras, S., Hunink, J., 2015. Drought effects on rainfed agriculture using standardized indices: A case study in SE Spain. In Andreu et al. (eds) Droughts: Research and Science-Policy Interfacing, 65-70. CRC Press (Taylor and Francis Group), London. ISBN: 978-1-138-02779-4.

Timmermans, W., et al., 2014. An overview of the Regional Experiments For Land-atmosphere Exchanges (REFLEX) 2012 Campaign. *Acta Geophysica* 63, 1465-1484; http://dx.doi.org/10.2478/s11600-014-0254-1.

Contreras, S., Cutillas, P., Santoni, C.S., Romero-Trigueros, C., Pedrero, F., Alarcón, J.J. Effects of reclaimed waters on spectral properties and leaf traits of Citrus orchards. *Water Environment Research* 86, 2242-2250; http://dx.doi.org/10.2175/106143014X14062131178637.

Contreras, S., Alcaraz-Segura, D., Scanlon, B., Jobbagy, E.G., 2013. Detecting ecosytem reliance on groundwater based on satellite-derived greenness anomaly and temporal dynamics. In D. Alcaraz-Segura, C.M. Di Bella, J.V. Straschnoy (eds.) *Earth observation of ecosystem services*. Chapter 13, 283-302. CRC Press – Francis & Taylor. Boca Raton. ISBN: 978-14-665058-8-9.

Contreras, S., Santoni, C.S., Jobbagy, E.G., 2013. Abrupt watercourse formation in a semiarid sedimentary landscape of central Argentina: The roles of forest clearing, rainfall variability, and seismic activity. *Ecohydrology* 6, 794-805; http://dx.doi.org/10.1002/eco.1302.

Moreno-Gutierrez, C., Battipaglia, G., Cherebuni, P., Saurer, M., Nicolás, E., **Contreras, S.**, Querejeta, J.I., 2012. Stand structure modulates the long-term vulnerability of *Pinus halepensis* to climatic drought in a semiarid Mediterranean ecosystem. *Plant, Cell and Environment* 35, 1026-1039; http://dx.doi.org/10.1111/j.1365-3040.2011.02469.x.

Li, X-Y., **Contreras, S.**, Solé-Benet, A., Cantón, Y., Domingo, F., Lázaro, R., Lin, H., Van Wesemael, B., Puigdefábregas, J., 2011. Controls of infiltration-runoff processes in Mediterranean karst rangelands in SE Spain. *Catena* 86, 98-109; http://dx.doi.org/10.1016/j.catena.2011.03.003.

Contreras, S., Jobbagy, E.G., Villagra, P.E., Nosetto, M.D., Puigdefábregas, J., 2011. Remote sensing estimates of supplementary water consumption by arid ecosystems of central Argentina. *Journal of Hydrology* 397, 10-22; http://dx.doi.org/10.1016/j.jhydrol.2010.11.014.

Alcalá, F.J., Cantón, Y., **Contreras, S.**, Were, A., Serrano-Ortiz, P., Puigdefábregas, J., Solé-Benet, A., Custodio, E., Domingo, F., 2011. Diffuse and concentrated recharge evaluation using physical and tracer techniques: Results from a semiarid carbonate massif aquifer in southeastern Spain. *Environmental Earth Sciences* 62, 541-557; http://dx.doi.org/10.1007/s12665-010-0546-y.

Alcalá, F.J., Solé-Benet, A., Cantón, Y., Ribeiro, L., **Contreras, S.**, Were, A., Serrano-Ortiz, P., Puigdefábregas, J., Domingo, F., 2011. Evaluación de la recarga difusa y concentrada en macizos carbonatados mediante técnicas físicas y de trazadores: Resultados obtenidos en Sierra de Gádor (Sureste de España). En M.C. Cabrera, L.J. Lambán, M. Manzano, M. Valverde (eds.) *Cuatro décadas de investigación y formación en aguas subterráneas. Libro homenaje al profesor Emilio Custodio*, 307-317. Asociación Internacional de Hidrogeólogos - Grupo Español, Zaragoza (Spain). ISBN: 978-84-938046-1-9.

Santoni, C.S., Jobbagy, E.G., **Contreras, S.**, 2010. Vadose zone transport in dry forests of central Argentina: The role of land use. *Water Resources Research* 46, W10541, http://dx.doi.org/10.1029/2009WR008784.

García, M., Domingo, F., **Contreras, S.**, Puigdefábregas, J., 2009. Mapping land degradation risk: potential of non-evaporative fraction using Aster and MODIS data. En A. Röder, J. Hill (eds.) *Recent advances in remote sensing and geoinformation processing for land degradation assessment*, Cap. 17: 261-279. ISPRS Book Series, CRC Press (Taylor and Francis Group), London. ISBN: 978-0-415-39769-8.

García, M., Oyonarte, C., Villagarcía, L., **Contreras, S.**, Domingo, F., Puigdefábregas, J., 2008. Monitoring land degradation using ASTER data: the non-evaporative fraction as an indicator of ecosystem function. *Remote Sensing of Environment* 112, 3469-3738; http://dx.doi.org/10.1016/j.rse.2008.05.011.

Contreras, S., Cantón, Y., Solé-Benet, A., 2008. Sieving crusts and macrofaunal activity control soil water repellency in semiarid environments: evidences from SE Spain. *Geoderma* 145, 252-258; http://dx.doi.org/10.1016/j.geoderma.2008.03.019.

Li, X.Y., **Contreras, S.**, Solé-Benet, A., 2008. Unsaturated hydraulic conductivity in limestone dolines: influence of vegetation and rock fragments. *Geoderma* 145, 288-294; http://dx.doi.org/10.1016/j.geoderma.2008.03.018.

Contreras, S., Boer, M.M., Alcalá, F.J., Domingo, F., García, M., Pulido-Bosch, A., Puigdefábregas, J., 2008. An ecohydrological modelling approach for assessing long-term recharge rates in semiarid karstic landscapes. *Journal of Hydrology* 351, 42-57; http://dx.doi.org/10.1016/j.jhydrol.2007.11.039.

Li, X.Y., **Contreras, S.**, Solé-Benet, A., 2007. Spatial distribution of rock fragments in dolines: a case study in a semiarid Mediterranean mountain-range (Sierra de Gádor, SE Spain). *Catena* 70, 366-374; http://dx.doi.org/10.1016/j.catena.2006.11.003.

García, M., Villagarcía, L., **Contreras, S.**, Domingo, F., Puigdefábregas, J., 2007. Comparision of three models estimating water deficit using reflective and thermal data from ASTER. *Sensors* 7, 860-883; http://dx.doi.org/10.3390/s7060860.

Contreras, S., Solé-Benet, A., 2003. Hidrofobia en suelos mediterráneos semiáridos: implicaciones hidrológicas para una pequeña cuenca experimental en el SE ibérico. *Revista Cuaternario y Geomorfología*, 17: 29-45.

Contreras, S., 2002. Los regadíos intensivos del Campo de Dalías (Almería). En J. Martínez Fernández, M.A. Esteve Selma (coords.) A*gua, regadío y sostenibilidad en el Sudeste ibérico*, 151-191., Ed. Bakeaz, Bilbao. ISBN: 978-84-88949-50-9.

Martínez Fernández, J., Esteve Selma, M.A., **Contreras, S.**, Bru Ronda, C., 2002. Hacia una mayor sostenibilidad de los regadíos intensivos del Sudeste ibérico. En J. Martínez Fernández, M.A. Esteve Selma (coords.) A*gua, regadío y sostenibilidad en el Sudeste ibérico*, 219-226. Ed. Bakeaz, Bilbao. ISBN: 978-84-88949-50-9.

Contreras, S., 2002. Apuntes sobre el modelo agrícola almeriense y nuevos enfoques al problema del agua. En S. Contreras, M. Piquer, J. Cabello (coords.) *Agricultura, Agua y Sostenibilidad en la provincia de Almería*, 11-28. Asoc. Posidonia y Junta de Andalucía, Almería. ISBN: 978-84-607-4163-3.

Contreras, S., Piquer, M., Cabello, J. (coords.), 2002. *Agricultura, Agua y Sostenibilidad en la provincia de Almería*, Asoc. Posidonia y Junta de Andalucía. ISBN: 978-84-607-4163-3. 285 pp.

Technical Reports and Teaching documents

Contreras, S., Alcolea, A., Jiménez-Martínez, J., Hunink, J.E., 2017. Cuantificación de la descarga subterránea al Mar Menor mediante modelización hidrogeológica del acuífero superficial Cuaternario. FutureWater Report 176, 91 pp.

Contreras, S., Hunink, J.E., Baille, A., 2017. Water and carbon fluxes in irrigated citrus orchards assessed from satellite data. FutureWater Report 174, 58 pp.

Hunink, J.E., **Contreras, S.**, Simons, G., Droogers, P., 2017. Hydrological evaluation and ecosystem valuation of the Lukanga swamps. FutureWater Report 167, 76 pp.

Hunink, J.E**., Contreras, S.**, Droogers, P., 2015. *Hydrological pre-feasibility assessment for the Romuku hydropower plant Central Sulawesi, Indonesia*. FutureWater Report 141, 38 pp.

Contreras, S., Hunink, J., 2015. *Water accounting at the basin scale: water use and supply (2000-2010) in the Segura River Basin using the SEEA framework*. FutureWater Report 138, 49 pp + 4 annexes.

Contreras, S., Hunink, J.E., Baille, A., 2014. *Building a Watershed Information System for the Campo de Cartagena basin (Spain) integrating hydrological modeling and remote sensing*. FutureWater Report 125, 59 pp.

Santoni, C.S., **Contreras, S.**, 2013. Impactos extremos en la hidrogeomorfología de cuencas semiáridas: Efectos de la deforestación y el cambio climático en el centro de Argentina. En García-Galiano, S.G. (Ed.) *Cambio climático e hidrología: desde la ciencia a la práctica en gestión hídrica y manejo del suelo*, 31-46. Universidad Politécnica de Cartagena, Cartagena (España). ISBN: 978-84-616-5700-1.

Contreras, S., Hunink, J., Lutz, A., Droogers, P., Immerzeel, W., 2013. Impactos del cambio climático en grandes cuencas montañosas: simulación hidrológica y estrategias de adaptación en la cuenca del Mar de Aral (Asia Central). En García-Galiano, S.G. (Ed.) *Cambio climático e hidrología: desde la*

ciencia a la práctica en gestión hídrica y manejo del suelo, 97-112. Universidad Politécnica de Cartagena, Cartagena (España). ISBN: 978-84-616-5700-1.

Contreras, S., 2006. *Distribución espacial del balance hídrico anual en regiones montañosas semiáridas. Aplicación en Sierra de Gádor (Almería)*. Tesis Doctoral (edición electrónica). Servicio de Publicaciones de la Universidad de Almería, Almería. ISBN: 978-84-8240-822-4.

Puigdefábregas, J., del Barrio, G., Boer, M., Cánton, Y., **Contreras, S.**, Domingo, F., Gónima, L., Lázaro, R., Moro, M.J., Solé-Benet, A., Villagarcía, L., 2004. *Inducción de la Recarga de Acuíferos en Zonas Semiáridas. Localización de áreas susceptibles de actuación. Último avance. Parte II.* Instituto del Agua de Andalucía - Junta de Andalucía.

Contreras, S., 2003. *Evaluación de la distribución espacial del drenaje en la Sierra de Gádor (Almería)*. Tesis de Tercer Ciclo. Departamento de Hidrogeología y Química Analítica, Universidad de Almería. 85 pp.

Contribution to congress and conferences

More than 40 contributions, to highlight: International Conference on Drought-R&SPI (Valencia, 2015), 12th European Ecological Federation Congress (Ávila, 2011), 42th American Geophysical Union Fall Meeting (San Francisco, 2009), XXIII Reunión Argentina de Ecología (San Luis, 2008), V Iberian Congress on Water Planning and Management (Faro, 2006), General Assembly European Geosciences Union (Vienna, 2005, 2016).

Peer-review activity

Journals: Agricultural Water Management, Arid Land Research and Management, Environmental Earth Sciences, Global Change Biology, Hydrological Processes, Hydrology and Earth System Sciences, International Journal of Remote Sensing, Journal of Arid Environments, Journal of Environmental Management, Journal of Hydrology, Journal of Hydrology - Regional Studies, Remote Sensing, Revista de la Facultad de Ciencias Agrarias de la Universidad Nacional de Cuyo, Soil Science Society of America Journal, Waste Management, Water Resources Research.

Evaluation pannels: National Agency for the Promotion of Science and Technology of Argentina (ANPCYT), Research Foundation Flanders, Spanish Agency of Evaluation and Prospective (AEI-ANEP)