



Ignacio Escuder Bueno holds a 6-Year (Bachelor plus Master's) Degree in **Civil Engineering** from Universidad Politécnica de Valencia (UPV, Spain), a **Master of Science in Civil Engineering** from University of Wisconsin-Milwaukee (UWM, USA) and a **PhD in Civil Engineering** from UPV. He is member of the Spanish Institution of Civil Engineers (Registered Professional Engineer since 1996).

He is a **University Professor** (UPV) as well as **promoter and associate founder of iPresas** (a technology based SPIN-OFF company of UPV). He has been **Visiting Professor** at University of Maryland (USA, 2014) and Utah State University (USA, 2006) and Teaching Assistant at UWM (USA, 1995-1996).

**President** of the **Spanish National Committee on Large Dams (SPANCOLD)** since october 2017.

He has been **Chairman of the International Committee on Dams Computational Aspects of the International Commission on Large Dams (ICOLD)** in the period 2011-2017 and **Secretary-General of ICOLD European Club** in the period 2010-2017. **Full Elected Member of the Spanish National Committee on Large Dams (SPANCOLD)** since 2007 and elected member of **SPANCOLD Board** since 2016. He was appointed in January 2016 by the Spanish Minister of Environment as member of the **Spanish Commission for Legal Codes for Design and Safety of Dams in Spain**.

He has been **Principal Investigator** on dam safety and risk analysis at **national level** projects as well as at **European level**. He has participated in scientific and **organizing committees** of numerous international congresses, symposia and workshops on these topics. Among others, he chaired the Organizing Committee of all (2005, 2008 and 2011) **International Weeks on Risk Analysis, Dam Safety, Dam Security and Critical Infrastructure Management**.

He has authored or co-authored more than **100 publications** and participated as invited speaker in more than **20 conferences** in various countries. He was coordinator and co-author of the **SPANCOLD Guideline** on "Risk Analysis Applied to Dam Safety Management" (2012), as well as co-author of the **ICOLD Bulletin 155** "Guidelines for Use of Numerical Models in Dam Engineering" (2011). He is a co-developer of the **software iPresas** for the performance of risk analysis in the field of dam safety.

**For more than 20 years**, he has worked as a consultant in areas related to safety studies, risk analysis and design projects concerning **more than 70 dams and hydropower facilities in Europe and America**. Among others, he has been involved with the Bajo Caroní river large dams in Venezuela, the Drin river dams in Albania and the Duero River Basin dams in Spain.

He regularly works as a **consultant for the World Bank and the Inter-American Bank of Development (IDB)** on developing governance strategies for natural hazards, critical infrastructures and dam safety. Among them, he was the principal author of the "Bolivian Guidelines for Hydropower Pre-Investment Projects with Special Focus on Disaster Risk Management (2016)". Currently, he is serving as member of the Independent External Panel for reviewing **US Army Corps of Engineers Dam Safety Program (2016-2017)**.



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## RELEVANT PROJECTS @ IPRESAS

- Technical assistance for numerical modelling of Chira and Soria dams  
 Entity: Insular Water Council of Gran Canaria (Spain)
- Risk-informed dam safety management of Pretura del Molino, Carrascalejo and las Majadillas dams  
 Entity: Regional Government of Extremadura (Spain)
- Project DAMSAFE: Enhancing Dam Safety and Water Management in Karnataka (India)  
 Funding entity: Netherlands Enterprise Agency (project led by Deltares)
- Support to dam safety and risk management in Brasil  
 Entity: Gas Natural Fenosa (under a contract for the World Bank)
- Technical assistance to introduce risk analysis techniques as a tool to support dam safety management in Argentina  
 Entity: Dam Safety Regulatory Agency of Argentina (ORSEP)
- 2017**
- Risk analysis of San Marcos dam  
 Entity: Regional Government of Extremadura (Spain)
- Independent External Expert for reviewing US Army Corps of Engineers Dam safety Program  
 Entity: US Army Corps of Engineers
- Quality control from a risk analysis perspective of the flood risk control measures at the Choluteca river in Tegucigalpa (Honduras)  
 Entity: Inter-American Development Bank (IDB)
- Pilot project to define procedures for quantitative estimation of spillway gate functionality and evaluate its impact on dam safety risk management  
 Entity: Gas Natural Fenosa (Spain)
- 2016**
- Risk analysis of Jaime Ozores dam  
 Entity: Regional Government of Extremadura (Spain)
- Risk analysis consultancy services for the portfolio of dams owned by Grupo Gas Natural Fenosa  
 Entity: Gas Natural Fenosa (Spain)
- Risk analysis study for supporting safety management in "El Vado" dam  
 Entity: Canal de Isabel II (Spain)
- 2015**
- Risk analysis of Membrío dam  
 Entity: Regional Government of Extremadura (Spain)
- Risk analysis for Fierze, Komani and Vau I Dejes dams (owned by KESH, Albania), including quantitative risk modelling and prioritization of risk reduction actions  
 Entity: Gas Natural Fenosa (under a contract for the World Bank)
- 2014**
- Risk analysis of "El Horcajo" dam  
 Entity: Regional Government of Extremadura (Spain)
- 2013**
- Comprehensive and quantitative risk analysis for Hällby dam: A case study in Sweden  
 Entity: ELFORSK (Sweden)
- Numerical modelling of La Aceña dam behaviour  
 Entity: Canal de Isabel II (Spain)
- Protection plan for a water treatment plant in Spain  
 Entity: Aguas de Valencia (Spain)
- 2012**
- Risk analysis of a portfolio of 27 dams owned by the Duero River Authority in Spain, including evaluation and prioritization of investments for risk reduction  
 Entity: Ofiteco (under a contract for the Duero River Authority in Spain)
- 2011**



## OTHER PROJECTS

- RDi projects (main researcher)
- Professional activities (consultancy)

- Risk analysis of Paso Severino dam (owned by OSE). "Water for Uruguay" Programme. Pillar 3: Regulatory framework for Dam Safety in Uruguay  
Entity: World Bank
- Local action plan against Flood Risk for the city of Oliva (Valencia)  
Entity: Oliva City Council
- Coordinator of activities for developing a Pre-Investment Guide for the Hydropower Sector including disaster risk criteria in Bolivia  
Entity: Inter-American Development Bank
- Local action plan against Flood Risk for the city of Benaguasil (Valencia)  
Entity: Benaguasil City Council
- Recommendations to improve the regulatory and institutional framework, and the development of dam safety management tools. Water Management and Infrastructure Development in Chile  
Entity: World Bank
- INICIA project: Methodology for evaluating investments in water cycle infrastructures based on risk and energy efficiency indicators  
Entity: Spanish Ministry of Economy and Competitiveness (MINECO)
- E2STORMED project: Improvement of energy efficiency in the water cycle by the use of innovative storm water management in smart Mediterranean cities ([www.e2stormed.eu](http://www.e2stormed.eu))  
Entity: MED Programme European Union
- IPRESARA project: Incorporating manmade threats into dam safety risk management  
Entity: Spanish Ministry of Science and Innovation (MICINN)
- Risk analysis and evaluation for Castrovido dam (under construction and owned by the Duero River Authority)  
Entity: FCC
- Comprehensive and quantitative risk analysis model for St. Ponç dam, including evaluation and prioritization of safety measures  
Entity: Agencia Catalana del Agua (Catalan Water Agency, Spain)
- SUFRI project: Sustainable strategies for Urban Flood Risk management to cope with the residual risk  
Entity: CRUE ERA-Net and Spanish Ministry of Education and Science
- Research project: Risk-based hydrologic dam safety management  
Entity: Spanish Ministry of Agriculture, Food and Environment (former MMA)
- Comprehensive and quantitative risk analysis model for a dam owned by Iberdrola, including evaluation and prioritization of safety measures  
Entity: Iberdrola
- Application of risk analysis to dam safety maintenance, monitoring, rehabilitation and management programmes  
Entity: Spanish Ministry of Science and Technology
- Monitoring and analysis of dam behaviour for 10 dams owned by the Ebro River Authority  
Entity: Ofiteco (for the Ebro River Authority)
- Dam safety analysis, evaluation and management of dams at the Caroní river (Venezuela)  
Entity: CVG Electrificación del Caroní C.A.
- DAMSE project: A European Methodology for the Security Assessment of Dams  
Entity: European Commission. Directorate General Justice, Freedom and Security
- Risk analysis models for Wolf Creek and Center Hill dams (Tennessee, US Army Corps of Engineers)  
Entity: UTAH State University
- Analysis of the influence of dam failure risk reduction on potential increase of unsatisfied demands in water resource systems  
Entity: Spanish Ministry of Science and Technology
- Studies related to dam behaviour analysis, including safety reviews and emergency action planning for Tous, San Blas, Benagéber, and Loriguilla dams in Valencia; Chanza, Jarrama, Piedras, Machos and Corumbel in Huelva; Regato and Gorostiza in Vizcaya; Arquillo de San Blas in Teruel; La Aceña in Ávila, el Limonero in Málaga and Breña, Sierra Boyera, Yeguas and Puente Nuevo in Córdoba.  
Entity: Ofiteco
- Land Transformation For Rice Crop On The River Volta (Ghana) and Rice Crop Experimental Project  
Entity: Agricultural Resources Africa Limited (Ara Ltd)
- Supervision, instrumentation and numerical modelling of a 103 meters high floodable embankment in Contreras reservoir (Spain)  
Entity: GESTESE SL (under a contract for Spanish Ministry of Civil Works)
- Special civil works plan for Gandia (Spain)  
Entity: PROYEX Valencia (under a grant of the European Investment Bank)








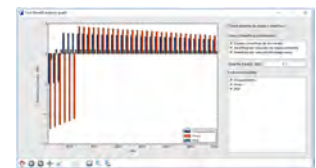
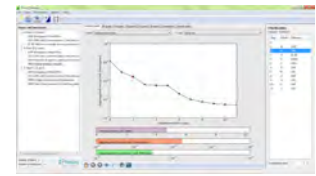
## SELECTED PUBLICATIONS

- A combined risk analysis approach for complex dam-levee systems. Castillo-Rodríguez, J.T., Needham, J., Morales-Torres, A. & Escuder-Bueno, I. Structure and Infrastructure Engineering. 2017.
- Overcoming failure root causes in infrastructure risk governance implementation: large dams case. Escuder-Bueno, I. & Halpin, E. Journal of Risk Research. 2016.
- Computational Aspects of Dam Risk Analysis: Findings and Challenges. Escuder-Bueno, I., Mazzà, G., Morales-Torres, A., & Castillo-Rodríguez, J. T. Engineering 2 (3), 319–324. 2016..
- A new risk reduction indicator for dam safety management combining efficiency and equity principles. Serrano-Lombillo, A., Morales-Torres, A., Escuder-Bueno, I., & Altarejos-García, L. Structure and Infrastructure Engineering. 2016.
- Decision Support Tool for energy-efficient, sustainable and integrated urban stormwater management. Morales-Torres, A., Escuder-Bueno, I., Andrés-Doménech, I. & Perales-Momparler, S. Environmental Modelling & Software. 2016.
- Enhancing local action planning through quantitative flood risk analysis: a case study in Spain. Castillo-Rodríguez, J.T., Escuder-Bueno, I., Perales-Momparler, S. & Porta-Sancho, J.R. Natural Hazards and Earth System Sciences, 16(7), 1699-1718. 2016.
- Building fragility curves of sliding failure of concrete gravity dams integrating natural and epistemic uncertainties. Morales-Torres, A., Escuder-Bueno, I., Altarejos-García, L., & Serrano-Lombillo, A. Engineering Structures, 125(2016), 227-235. 2016.
- The role of monitoring sustainable drainage systems for promoting transition towards regenerative urban built environments: a case study in the Valencian region, Spain. Perales-Momparler, S., Andrés-Doménech, I., Hernández-Crespo, C., Vallés-Morán, F., Martín, M. Escuder-Bueno, I., & Andreu, J. Journal of Cleaner Production. 2016.
- The suitability of risk reduction indicators to inform dam safety management. Morales-Torres, A., Serrano-Lombillo, A., Escuder-Bueno, I., & Altarejos-García, L. Structure and Infrastructure Engineering. 2016.
- Advances on the Failure Analysis of the Dam—Foundation Interface of Concrete Dams. Altarejos-García, L., Escuder-Bueno, I., & Morales-Torres, A. Materials, 8(12), 8255–8278. 2015.
- A regenerative urban stormwater management methodology: the journey of a Mediterranean city. Perales-Momparler, S., Andrés-Doménech, I., Andreu, J., & Escuder-Bueno, I. Journal of Cleaner Production, 109, 174-189. 2015.
- Practical risk assessment for embankments, dams, and slopes. Altarejos-García, L., Silva-Tulla, F., Escuder-Bueno, I., & Morales-Torres, A. Chapter of Risk and Reliability in Geotechnical Engineering, 437–469. CRC Press. 2015.
- The value of integrating information from multiple hazards for flood risk analysis and management. Castillo-Rodríguez, J.T., Escuder-Bueno, I., Altarejos-García, L., & Serrano-Lombillo, A. Natural Hazards and Earth System Sciences, 14, 379-400. 2014.
- Metodología para la evaluación del riesgo hidrológico de presas y priorización de medidas correctoras. Altarejos-García, L., Castillo-Rodríguez, J.T., Chacón-Cano, M., Durán-Barroso, P., Escuder-Bueno, I., Fluxá-Sanmartín, J., González-Pérez, J., Morales-Torres, A., & Serrano-Lombillo, A. Autor de Capítulos 2, 3 y 4. Colegio de Ingenieros de Caminos, Canales y Puertos. 2014. [In Spanish]
- A quantitative flood risk analysis methodology for urban areas with integration of social research data. Escuder-Bueno, I., Castillo-Rodríguez, J.T., Zechner, S., Jöbstl, C., Perales-Momparler, S., & Petaccia, G. Natural Hazards and Earth System Sciences, 12, 2843-2863. 2012.
- Assessing the impact of uncertainty on flood risk estimates with reliability analysis using 1-D and 2-D hydraulic models. Altarejos-García, L., Martínez-Chenoll, M.L., Escuder-Bueno, I., & Serrano-Lombillo, A. Hydrology and Earth System Science, 16, 1985-1994. 2012.
- Risk Analysis, Dam Safety, Dam Security and Critical Infrastructure Management. Escuder-Bueno, I., Matheu, E., Altarejos-García, L., & Castillo-Rodríguez, J.T. Eds. Leiden: CRC Press, 2012.
- Methodology for estimating the probability of failure by sliding in concrete gravity dams in the context of risk analysis. Altarejos-García, L., Escuder-Bueno, I., Serrano-Lombillo, A., & de Membrillera-Ortuño, M.G. Structural Safety, 34 (1). 2012.
- Technical Guide on Dam and Reservoir Operation, N.8, Vol.I., Risk Analysis applied to Dam Safety Management, SPANCOLD. 2012.
- Coauthor of ICOLD Bulletin 155: Guidelines for use of numerical models in dam Engineering. 2011.
- Methodology for the calculation of annualized incremental risks in systems of dams. Serrano, A., Escuder, I., Membrillera, M., & Altarejos, L. Risk Analysis, 31. 2011.
- Reliability assessment of granular filters in embankment dams. Mínguez, R., Delgado, F., Escuder, I., & de Membrillera, M.G. Int. J. for Numerical and Analytical Methods in Geomechanics, 30 (10), 1019-1037. 2006.
- Aplicación del Análisis de Riesgos a la Seguridad de Presas. Membrillera, M.G., Escuder, I., González, J., & Altarejos, L. Editorial Universidad Politécnica de Valencia (UPV). 2005. [In Spanish]



## PROFESSIONAL SKILLS

	Dam safety management	● ● ● ● ● ●
	Risk analysis	● ● ● ● ● ●
	Critical infrastructure governance	● ● ● ● ● ●
	Urban flood risk analysis	● ● ● ● ● ●
	Numerical modelling	● ● ● ● ● ●
	Software development	● ● ● ● ● ○
	Green infrastructures	● ● ● ● ● ○



## RECENT COURSES, LECTURES AND CONFERENCES

- Course on Risk Analysis applied to Dam Safety Management organized by the Argentinian National Committee on Large Dams (CAP). 2016.
- Methods to compute natural disasters risk (including climate change effects) organized by the Inter-american Development Bank. 2016.
- 1st edition of the Course on Risk Analysis applied to Dam Safety Management - Advanced Level, organized by the Spanish National Committee on Large Dams (SPANCOLD). 2016.
- Course on "Urban stormwater management using Sustainable Drainage Systems", organized by the Polytechnic University of Valencia. 2016.
- Chair of session "Innovation in the use of dams and reservoirs", during the XXV ICOLD Congress, held in Stavanger (Norway). 2015.
- Practical course "Software E<sup>2</sup>STORMED for multicriteria evaluation of solutions for urban drainage", organized by the Polytechnic University of Valencia. 2015.
- Invited speaker in the HydroVision International panel session entitled "Risk Assessment: What in this world are we doing?". 2014.
- Seminar titled "Smart governance and community resilience with an application to dams" at the Princeton University (New Jersey). 2014.
- 4 editions of the Course on Risk Analysis applied to Dam Safety Management - Basic Level, conducted in English and Spanish, organized by the Spanish National Committee on Large Dams (SPANCOLD). 2013-2016.
- Since 2011, lecturer of Dam Safety Management, International Master on Dam Safety and Operation, organized by SPANCOLD.
- Course on Risk Analysis applied to Dam Safety Management, organized by the Swedish National Committee on Large Dams (SWEDCOLD). 2010.



## OTHER MERITS AND ACTIVITIES

- Member of the Spanish Commission for Legal Codes for Design and Safety of Dams in Spain.
- Elected member of Spanish National Committee on Large Dams (SPANCOLD) Board since 2016.
- Co-developer of iPresas software for risk analysis of dams using event tree modelling.
- Formulator of 3 themes related to risk analysis for the last editions of the ICOLD International Benchmark Workshop on Numerical Analysis of Dams, in Valencia (2011), Graz (2013) and Lausanne (2015).
- Member of the Organizing Committee of the Spanish Conference on Dams in 2008, 2010 and 2015, organized by SPANCOLD.
- 2nd award Valencia IDEA 2014, organized by Valencia City Council, Energy and Environment category (in collaboration with Adrián Morales Torres in the framework of the E<sup>2</sup>STORMED project).
- Chairman of the Organizing Committee of the 3rd International Forum on Risk Analysis, Dam Safety, Dam Security and Critical Infrastructure Management, organized at the UPV, Valencia. 2011.
- BANCAJA Entrepreneurs 2010 Award, iPresas Business Plan.
- Chairman of the Organizing and Scientific Committee of the 3 editions of the International Week on Risk Analysis, Dam Safety, Dam Security and Critical Infrastructure Management, Valencia, 2005-2008-2011.

