

MISHEL MILAGROS MELENDEZ BERNARDO

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EDUCATION

River
Environments
and their
Management
Msc (c) *
University of Birmingham
School of Geography
* Scholarship from PRONABEC (Peru's Government)

Civil Engineer
(2009-2014)
National University of Engineering, Lima - Peru
GPA: 3.5 / 4.0

CERTIFICATIONS

GRE	Verbal Reasoning	151
	Quantitative Reasoning	165
	Analytical Writing	3.0

TOEFL 98

IELTS 7.0

RESEARCH EXPERIENCE

September 2017 to August 2018, CITA UTEC*

Research assistant

- **FUNCTIONS:** Support in fieldwork to gather information with the equipment available in the center: bathymetry (echo sounders), sedimentology (suspended and bed load samplers), speeds (ADCP) among others; laboratory analysis of soil and sediment samples in general, using granulometric and diffraction methods.
- **PROJECTS:** (1) Integrated management of water resources in the Chancay - Lambayeque and Huatanay watersheds. (2) Hydrological, hydraulic and sedimentological studies carried out for the determination of the localization of the border care center (CAF), as part of the pre-inversion study at project profile level: improvement of the person, luggage, goods and vehicles control service in the step of frontier Santa Rosa, district of Yavari, province of Ramón Castilla, Loreto region.
- **FIELDWORKS:** Madre de Dios, Boca Colorado, Inambari, Amazonas, Ucayali and Marañon rivers in amazon zone; Chancay river and another important creeks in highlands zone.

*Water Research and Technology Center, University of Engineering and Technology

December 2016 to Present, IGI*, National University of Engineering

Junior researcher

- **COMPETITION/PROJECT:** Projects of training research developed by students and undergraduate teachers 2017/ Hydrosedimentological and morphological effects assessment of breakwater on the migration of Madre de Dios River – La Pastora. RESEARCH AMOUNT: 24800 soles or \$7650.

- ACTIVITIES: Fieldworks, Evolution of Madre de Dios river with LANDSAT gallery collection, RVR Meander & TELEMAC modelling (in process), writing and diffusion of results (in process).

*General Institute of Research

WORK EXPERIENCE

February 2015 to January 2017, Anddes Asociados SAC

Hydraulic/Hydrologic Engineer

- Hydrological and hydraulic modelling with empirical (HEC-HMS) and one-dimensional software (HEC-RAS) respectively, as well as tailing and water dam failure analyses with two-dimensional software (RIVERFLOW & Iber).
- Carried out hydraulic inspection of mining structures; in addition, I wrote inspections reports, it includes visual observations as well as hydraulic conditions and stability.
- Elaboration of Hydrologic Maps (watersheds, drainage, slope, etc) with GIS software.
- Writing of design reports.

January 2014 to January 2015, Mansen + Kuroiwa Ingenieros SAC

Technical Office Assistant

- Carried out hydrological and hydraulic modelling (HEC-HMS & HEC-RAS) software.
- Writing of design reports.

January 2013 to March 2013, Rizzo Associates Peru SAC

Technical Office Assistant

- Designed structures and elaboration of maps with AutoCAD CIVIL and GIS software respectively.

July 2012 to August 2012, CESEL Ingenieros SA

Technical Office Assistant

- Designed channel structures with AutoCAD CIVIL and H-CANALES software.

January 2013 to March 2013, LNH*

Technical Office Assistant

- Support in the determination of Peruvian water footprint.

* National Hydraulic Laboratory

AWARDS

- Career Event Organizer 2019 – River Environments and their Management Msc, University of Birmingham

* Held by the venue of Dr. Anne Van Loon (a.f.vanloon@bham.ac.uk), Head of Msc Program in the School of Geography

- Best research Project 2017, IIFIC UNI*

* Institute of Research of the Faculty of Civil Engineering – National University of Engineering

- Outstanding Student Diploma with the best average of the promotion in the Hydraulics and Hydrology Area 2014-II, FIC UNI**

** Faculty of Civil Engineering – National University of Engineering

PAPERS, CONFERENCE PRESENTATIONS AND INTERNATIONAL COURSES

September 2018, XXVIII Latin American Hydraulic Congress 2018, Buenos Aires - Argentina
Conference speaker

- Hydrodynamic Evaluation of Pastora Meander with spigons*

*The topic was selected in Peru for a \$500 of funding and the inscription for the congress as well (\$350).

November 2017, VIII Regional Symposium on River Hydraulics 2017, Cordoba - Argentina
Conference speaker

- Hydraulic Analysis in a meander of the Madre de Dios river with the interaction of Spigons - La Pastora Zone.

October 2017, 2nd Cornell Working Group Meeting, Lima - Peru
Workshop Assistant

July 2016, 5th International Symposium on Sediment Management (IzSM), Quebec - Canada
Conference assistant & co-author

- Modelling of erosion in watersheds and retention of sediments in mining.

August 2015, 3rd International Seminar on Tailings Management – Tailings 2015, Santiago - Chile

Co-author

- Considerations on dam breach analysis of tailing storage facilities

ACTIVITIES

2012 to present, Student Group Applied To Hydraulics And Hydrology (GEAHH)

Founder, Former president (2014-2015) and active member

As undergraduate student, I supervised and organized hydrological/ hydraulic courses of different topics at the same time of our university curricula. This brings me the opportunity to share up-to-date knowledge and at the same time to propel students' careers forward. In November 2017, we celebrated 5 years since its foundation.

PAPERS' ABSTRACTS

November 2017, VIII Regional Symposium on River Hydraulics 2017, Cordoba – Argentina

Hydraulic Analysis in a meander of the Madre de Dios river with the Interaction of Spigons - La Pastora Zone.

ABSTRACT: Peruvian Amazon is characterized by the presence of meandering rivers. Dynamic of this kind of rivers include its constant change of course and sinuous morphology. In addition, their patterns of evolution are so important as those affecting the river protection infrastructure, like is the case of a bend called La Pastora of Madre de Dios river, which had been approaching to the Interoceanic Highway.

In this particular case, and with the objective of stop the erosion progress, in that bend were built some semipermeable breakwater structures, which had been selected as the best solution in the wake of good results from the experiments in physical and 2D-hydraulic models. Two years after being operating, with the chance of the happening two droughts and floods stages, the present paper have the main focus of the development of an integrated geomorphological and engineering evaluation of the performance of semipermeable breakwater structures in the bend of Madre de Dios river due to the recent failure of one of the piers which is part of the breakwater structures as well as the apparent constant erosion on the right bank of the river. First, it has been elaborated the multiscale analysis of the complete meander since 1984 to 2014 (period before the installation of structures) with the intention of describing the evolution of the Madre de Dios river. Subsequently, field data were collected along the bend on Madre de Dios River such as measurements of velocities and sediments during April and August of 2017. In addition, it has been compared the bathymetries before and after the construction of the breakwaters to bear out the expected sedimentation in the initial erosion zone.

July 2016, 5th International Symposium on Sediment Management (I2SM), Quebec – Canada

Modeling of watershed erosion and sediment retention in mining activity

ABSTRACT: In Peru, mining has been constantly developed until becoming one of the most important economic activities. Thus, a hydrology topic to develop, when the extractive operations end, is the soil erosion on basins or catchments where the mine has influence. The importance of this article is based on preserving natural ecosystems to maintain water quality of rivers or watercourses, and promoting the mining activity as one of the primary activities. In determining the quantity of dregs (sediments), the Modified Universal Soil Loss Equation (MUSLE) will be used, published by United States Department of Agriculture (USDA) in 1997.

The main goal of this paper is to compare the initial and final scenarios; using tools like Geographic Information System (GIS) and sediment models, with the objective of measuring the impact of mining activity on soil erosion and sediment production in a specific gorge. Moreover, the dreg model will allow to design and calculate the retention structures of the basin in analysis.

Considerations on dam breach analysis of tailing storage facilities

ABSTRACT: The operation of tailings storages facilities (TSF) involves a potential risk for people and infrastructure located in areas downstream, which may include loss of life, inundation, and damage to buildings such as houses, bridges, farm lands and contamination of water sources. In consequence, it is necessary (or mandatory in some countries) to perform a dam breach analysis of a TSF in order to assess the magnitude of the flood wave and volume of tailing released to define remediation measures. Furthermore, the results of the dam breach analysis can be used to define the dam classification according to the Canadian Dam Association guidelines. However, it is important to mention that most guidelines and codes for dam breach analysis are oriented for water dams; nevertheless, there are few technical reports or methodologies available for TSF.

The objective of this paper is to discuss the technical considerations considered when a dam breach analysis of a TSF is performed, based on the practical experience to develop simulations in several case studies in Peru. There are two important points to understand dam breach analysis of a TSF: the generation of hydrographs due to the tailings breach and flow routing for identifying the flood timing, depths and velocities through the natural channel and valleys. To determine which failure mode produces the most critical hydrograph, scenarios such as seismic events, extreme meteorological conditions, poor tailings management, vandalism, among others, were evaluated according to the work area. Besides, the flow must be modeled as a non-Newtonian fluid using physical, chemical and rheological properties of tailings. Results of the dam breach analysis for the case studies will be presented.