CURSOS DE VERANO
El Escorial
Universidad Complutense
2018 Madrid

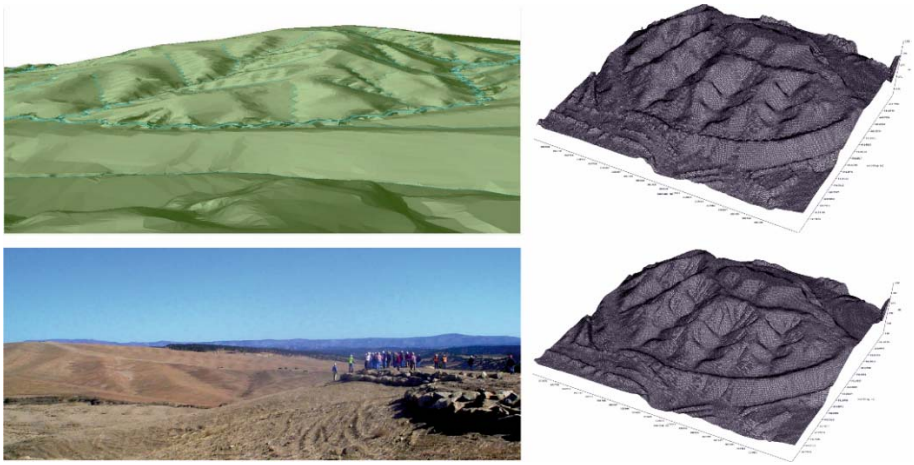
UNIVERSIDAD COMPLUTENSE MADRID

cursos COMPLUTENSE verano El Escorial

COMPLUTENSE INTERNATIONAL COURSE (C.I.C.)

LANDFORM DESIGN AND MODELLING FOR BEST PRACTISE IN MINE REHABILITATION

Director – Prof. José F. Martín Duque (Complutense University, Geosciencies Institute IGEO, Spain)
Secretary – Roderick M. Eckels (Landforma, Australia)
Lecturers – Prof. Gregory R. Hancock (University of Newcastle, Australia), Nicholas Bugosh (GeoFluv, United States)
Assistant: Néstor Hernando (Complutense University, Spain)
Dates Sept 18 – 21, 2018; Hours: 28
Place: Faculty of Geology, Complutense University, Madrid, Spain
Number of participants – 40



Upper left: 3D perspective view of the GeoFluv computer-aided design (CAD) made using Natural Regrade for a large out-of-pit waste material pile (La Plata, New Mexico, US). Lower left: image of the same large out-of-pit waste material pile immediately after construction grading and application of top-dressing material, but before vegetation has sprouted, seen from a different perspective. Upper right: GeoFluv landform design at Drayton mine (New South Wales, Australia). Lower right, 100-yr SIBERIA modelling of the same area.

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Programa REMEDINAL-3 S2013/MAE-2719

FUNDACIÓN TORMES-EB

AIM OF THE COURSE

Help promoting Geomorphic Design and Landscape Evolution Modelling, by qualified training, for current and future Best Practice in Mine Rehabilitation, at an international level.

INTRODUCTION

Mining is necessary for maintaining society's current lifestyle and facilitating future growth and will continue to develop at a global scale. Even if the use of some mineral resources may decline (such as coal), the need for other minerals for emerging technologies will concurrently grow. The generation of solid and liquid wastes and their discharge onto land and into waterways are arguably the greatest impacts on the environment associated with mining. The science of Geomorphology provides the best framework for understanding and quantifying stability and changes in erosion and sedimentation, which is the root of the wastes' release to the environment from disturbed mine sites. When fluvial geomorphic processes are integrated for designing steady state and functional landforms, the mine-rehabilitated lands can perform like stable natural ones. This process is enhanced by using Landscape Evolution Models (LEM) that simulate the evolution of landforms subjected to fluvial erosion and mass transport processes. LEM use widely accepted hydrology and erosion models under the action of runoff and erosion over variable-time scales. Current worldwide cutting-edge best practice in disturbed mine rehabilitation merge methods and packages for landform design and landscape evolution modelling, increasing their capabilities. This course is an introduction of what are considered some of the best available techniques, on a global scale, for Fluvial Geomorphic Design (GeoFluv – Natural Regrade) and LEM (SIBERIA) for best practice in mine rehabilitation. The practical emphasis is strong, almost totally focused in the use of specific dedicated software, taught by the best experts worldwide. It is completed with lecturers about the state of art of geomorphic mine rehabilitation and GPS machine guidance for geomorphic mine rehabilitation. Field work, discussions and networking complement the course.

LECTURERS AND TRAINERS

Greg Hancock, Associate Professor at the University of Newcastle (Australia). Greg made his Ph.D. on the use of the SIBERIA model under the supervision of Professor Garry Willgoose, inventor of the Landscape Evolution Model SIBERIA. He has more than 25 years of experience in the use of SIBERIA, and he is one of the most influential authors worldwide in the field of landform stability in mine rehabilitation. He also masters the use of other Landscape Evolution and Soil Erosion models. https://www.newcastle.edu.au/profile/greg-hancock

Nicholas Bugosh, Principal of the GeoFluv company (www.geofluv.com, United States). Nicholas Bugosh is the inventor of the patented and widely-acclaimed GeoFluv method and the Natural Regrade software. He is, therefore, the best expert, worldwide, in this technique, which has been identified as Best Available Technique for Mine Rehabilitation both in the US and at the EU.

José F. Martín Duque, Associate Professor at the Complutense University of Madrid, Spain. His extensive work has included design, modelling, monitoring and publishing in erosion and geomorphic rehabilitation of mined lands since 1995. He directs a specialized research and technology-transfer university group (www.restauraciongeomorfologica.es) on this topic and teaches it for two master programs. José has led many projects in this field, and has lectured about this innovative discipline, in many different countries.

Rod Eckels, graduate and master in Surveying, is specialized in applying high-accuracy GPS to surveying applications. In 1987, Rod joined Leica Geosystems, to promote and support their range of GPS surveying equipment in the Australasian region. In 1997, Rod moved to California with Leica, where his role was to develop new applications for GPS in machine guidance and control systems. He then met Nicholas Bugosh, who was implementing the GeoFluv approach at the BHP La Plata open pit mine in New Mexico. In 2006, he started "Landforma" (https://www.landforma.com/) to promote the Fluvial Geomorphic approach to land rehabilitation in Australia.

PROGRAM

1. *Geomorphic mine rehabilitation. State of art at a global scale.* Opening lecture. Prof. José F. Martín Duque (Complutense, University, Spain)
2. *Fluvial geomorphic landform design for best practice in mine rehabilitation. The GeoFluv method and the Natural Regrade software.* Nicholas Bugosh (GeoFluv, United States)
3. *Landscape Evolution Models for best practice in mine rehabilitation. SIBERIA and EAMS Viewer.* Prof. Greg Hancock (University of Newcastle, Australia).
4. *GPS machine guidance for fluvial geomorphic landform reconstruction in mine rehabilitation.* Rod Eckels (Landforma, Australia)

SCHEDULE (September 2018)

	Tuesday 18th	**Wednesday 19th**	**Thursday 20th**	**Friday 21nd**
8:30 – 9:30	Welcome. Academic Authorities Opening Lecture	Lecture on GPS Machine Guidance	Field work (i): Geomorphic mine rehabilitation examples at the kaolin mines of the Alto Tajo region	Field work for students getting ECTS; / Guided walking tour of Historical Madrid (free for participants)
9:30 – 11:00	GeoFluv-Natural Regrade (G1) LEM-SIBERIA (G2)	GeoFluv-Natural Regrade (G2) LEM-SIBERIA (G1)		
11:00 – 11:30	*Morning coffee break*	*Morning coffee break*		
11:30 – 13:30	GeoFluv-Natural Regrade (G1) LEM-SIBERIA (G2)	GeoFluv-Natural Regrade(G1, NB) LEM-SIBERIA (G1)		
13:30 – 15:00	*Lunch*	*Lunch*		
15:00 – 16:30	GeoFluv-Natural Regrade (G1) LEM-SIBERIA (G2)	GeoFluv-Natural Regrade(G1, NB) LEM-SIBERIA (G1)		
16:30 – 17:00	*Afternoon coffee break*	*Afternoon coffee break*		
17:00 – 18:30	GeoFluv-Natural Regrade (G1) LEM-SIBERIA (G2)	Round table Closing		
		Course Dinner		

Profile of expected participants

University students, graduated and master related with environment and mining, and all types of professionals and administrative staff involved with mine rehabilitation.

Language

The whole course will be taught in English.

Participants

There are 20 seats for university students or unemployed graduates and master professionals, with a registration fee of 400 €, and 20 seats for professionals and administrative staff, with a registration fee of 1000 €. In both cases, registration includes course enrollment, coffee and lunch allowance, course dinner, field work visit (bus and lunch) and guided walking tour of Historical Madrid. If any of the 20 seats for each category is not completed, it will be open to the other category. This 28-hour course is equivalent to a **2 credits course, only for UCM enrolled students.**

Location

Assembly hall and computer labs of the Faculty of Geology, Complutense University of Madrid, Calle Jose Antonio Novais 2, 28040 Madrid, Spain (40.448871, -3.725714)

Online Registration

Please, access through http://www.ucm.es/cursosdeverano/programacion (Matrícula Online, right side). For concerns and doubts regarding online registration for Spanish-speaking people, please contact General Foundation UCM, Department of Information and Registration (mafgucm@ucm.es, Phone (+34) 913948408, Monday through Friday, 9:00 – 14:00). For English-speaking people, please contact Néstor Hernando (nehern01@ucm.es). A detailed program of the course, or additional information, is available upon request as well to nehern01@ucm.es.