CURRICULUM VITAE of CARLO GREGORETTI

Date of birth: 07/01/67 Age: 50
Place of birth Rome
Status not married

Education

1996 P.h.D. in Hydrodynamics - University of Padova
The title of the Dissertation was : "Experimental study of debtris flow triggered by a progressive erosion of a slope" – Supervisor Prof. G. Di Silvio – *Department of Civil and Environmental Engineering.*

1992 MSc. Degree in Civil Engineering with specialization in Hydraulics - University of Padova
The title of the Thesis was: "Flow stability and resistance of supercritical currents". Supervisor was Prof. L. Dalpaos – *Department of Civil and Environmental Engineering.*

Current Position

Assistant Professor of Agricoltural Hydraulics and Forest Engineering, *University of Padova - Department Land and Agro-Forest Environment*, Italy, 1998-present

Past Academic Employment

Post-Doctorate Fellowship, *University of Ferrara, Department of Engineering*, Italy, 1997-1998

Associate Researcher, *HR Wallingford, Oxford*, England, 1997

Associate Researcher, *University of Firenze, Department of Civil and Environmental Engineering,* Italy, 1996-1997

Didactical activity

Member of the teaching staff of the Doctorate School: Land, Environment, Resources and Health of the *Land and Agro-Forest Environment Department, University of Padova,* 2007-present

Member of the teaching staff of the Doctorate: Watershed Management and Land GIS Representation at the *Land and Agro-Forest Environment Department, University of Padova,* 2001-2007

Member of the teaching staff of the Master: Land and Enviroment Defence and Preservation at the *Land and Agro-Forest Environment Department, University of Padova,* 2002-2006

Lecturer of the following courses at the Faculty of Agricultural Sciences of the University of Padova (from 2013 School of Agricultural Sciencies and Veterinary Medicine)

Hydraulics and Hydrology for the Bsc[1]. degree in *Land Defence and Preservation*, 2001-2004
Principles of Hydraulics for the Msc[2]. degree in *Sciences and Tecnologies for the Environment Defense*, 2004-2008
Hydraulics and Water Resources Management for the Msc. degree in *Acquacultural Engineering*, 2006-2008
Forest Engineering for the Bsc. degree in *Forestry and Environmental Technologies* 2008-2009
Applied Engineering for the Bsc. degree in *Land Defence and Preservation* 2008-2012
Fundamentals of Environmental Hydraulics for the Msc. degree in *Sciences and Tecnologies for the Environment Defense*, 2009-2010
Slope Stability and Consolidation for the Bsc. degree in *Land Defence and Preservation* 2012-2016
Basic of contructions for the land and the environment for the Bsc. degree in *Land Defence and Preservation* 2016-2017

A.Y.	Course	Degree
2001-2004	Hydraulics and Hydrology	*Land Defence and Preservation* (Bsc)
2004-2008	Principles of Hydraulics	*Sciences and Tecnologies for the Environment Defense* (Msc)
2006-2008	Hydraulics and Water Resources Management	*Acquacultural Engineering* (Msc)
2008-2009	Forest Engineering	*Forestry and Environmental Technologies* (Bsc)
2009-2010	Fundamentals of Environmental Hydraulics	*Sciences and Tecnologies for the Environment Defense* (Msc)
2009-2012	Applied Engineering	*Land Defence and Preservation* (Bsc)
2012-2016	Slope Stability and Consolidation	*Land Defence and Preservation* (Bsc)
2016-2017	Basic of contructions for the land and the environment	*Land Defence and Preservation* (Bsc)

Bsc Batchlor degree: 3 years degree
Msc Master degree: 5 years degree (old) or 2 year degree after the Bsc (new)

Teaching material

Static and Geothecnics (in Italian) available on www.agraria.unipd.it
Hydraulics (in Italian) available on www.agraria.unipd.it
Statistical Hydrology (in Italian) available on www.agraria.unipd.it
Environmental Hydraulics (in Italian) available on www.agraria.unipd.it

Books

Fundamentals of theory and tecnicques of constructions with exercises. Cleup Editore – Padova 2016

Collaborators

Past collaborators

Massimo Degetto (PhD) Associate researcher July 2009- 2014
Giacomo Crucil (Msc in Forestry and Environmental Sciencies) Fellowship recipient April 2013 – December 2013.
Alessandro Pimazzoni (Bsc in *Forestry and Environmental Technologies*) Fellowship recipient April 2013 – December 2013.
Carlo Masetto (Msc in Environmental Engineering) Fellowship recipient August 2010 – October 2011.
Mario Furlan (Msc in Forestry and Environmental Sciencies) Fellowship recipient July 2009 – January 2010.

Current Msc students

Nicola Rosson (Msc in Forestry and Environmental Sciences) *Back analysis of the debris flow occurred in July 2015 at Fiames (Dolomites, North-East Italy)"*..

Current Bsc students

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Current collaborator

Giacomo Crucil (Msc in Forestry and Environmental Sciencies) Fellowship recipient May 2016 – September 2016.

Supervisor of Postgraduate student

Mauro Boreggio (PhD) 2015- Monitoring and modeling debris flows routing.

Martino Bernard (PhD) 2014- Monitoring rainfall and runoff triggering debris flow. Modeling runoff triggering debris flow.

Alessandro Maltauro (PhD) "*Bottom shear stress and velocity profiles measurements in low submergence flow over a permeable gravel bed*", 2007-2008, currently employed in a construction society

Cosupervisor of postgraduated student

Monica Montoya Cardona (PhD) "*Dynamic-morphological analysis of a quasi-meandriform river by numerical bed mobile models*", 2005-2008, currently project engineer in a engineering society

Msc Graduated students

Graduated in 2015-2007

1. Ruggiero Alberti (Msc in Forestry and Environmental Sciences) "*Back analysis of the debris flow occurred at Baselga di Pinè the 15th of August (Northeastern Italian Alps)"*

2. Mauro Boreggio (Msc in Forestry and Environmental Sciences) "*Comparison of two numerical codes through the back analysis of three debris flows occurred in the Northeastern Italian Alps"*
3. Giacomo Crucil (Msc in Forestry and Environmental Sciencies), "*Monitoring and modeling debris flows in the Fiames area"*.
4. Mario Furlan (Msc in Forestry and Environmental Sciencies), "*Simulation by numerical model of debris flow occurred at Fiames and Rio Lazer and comparison with post event measurements"*. Currently employed in a private company.
5. Daniele Dainese (Msc in Geological Sciencies) "*Measurement of debris flow deposits in the sites of Fiames"*. Currently employed in a geological private society.
6. Massimo Bertelle (Msc in Forestry and Environmental Sciencies), "*Sediment transport in mountain streams: comparison between literature and newly proposed bed load relationships*", currently owner of a shop.
7. Alessandro Maltauro (Msc in Forestry and Environmental Sciencies), "*Experimental study of the failure of an homogeneos sediment dam in a laboratory flume*", currently PhD student (see above).
8. Ezio Pilotto (Msc in Forestry and Environmental Sciencies), "*Study of the triggering of debris flow in the sites of Fiames and Acquabona*", currently in the Forest Service of Vicenza district

Graduated in 2006-1999

1. Veronica Baccalà (Msc in Forestry and Environmental Sciencies), "*The role of the evapotranspiration in daily stream flow fluctuations in a small alpine catchment* "., 2006
2. Di Raimondo Daniele (Msc in Forestry and Environmental Sciencies), "*Simulation of debris flow routing on a fan by the numerical model Flo-2D*", 2005
3. Alessandro Bagato (Msc in Forestry and Environmental Sciencies), "*Study of the triggering of debris flow in four catchments of Dolomites*",2003, currently in the Forest Service.
4. Marco Pontin (Msc in Civil Hydraulic Engineering), "*Rotational incipient motion model of sediments at high slopes*",2002, currently project engineer and hydraulic modelist (freelance)
5. Pierpaolo Ruggiero (Msc in Environmental Engineering), "*Sediment transport originated by the progressive erosion of a partially saturated slope*", 2001,currently project engineer in a engineer society.
6. Silvio Grisotto (Msc in Forestry and Environmental Sciencies), "*Study of the triggering of debris flow in the catchment of Rio Val della Vecchia*",1999, currently forestry consultant (freelance).

Bsc Graduated students

Graduated in 2015

1. Mario Visentin (Bsc in Forestry and Environmental Technologies), *Influence of wind on the rainfall and runoff modeling in high mountain watershed.*

Graduated in 2014

1. Nicola Rosson (Bsc in Land Defence and Preservation) *Monitoring debris flow erodible and depositable sediment volume at Fiames (Dolomites, North-East Italy)"*

2. Carlo Tittonel (Bsc in Land Defence and Preservation) "*Monitoring convective rainfalls at Fiames (Dolomites, North-East Italy)"*

3. Luca Venturini (Bsc in Land Defence and Preservation) "*Design of a retaining wall in high mountain area against debris flow hazard (Dolomites, North-East Italy)"*..

Graduated in 2013

1. Alessandro Pimazzoni (Bsc in Forestry and Environmental Technologies), "*Setting up of a monitoring station for runoff triggering debris flows at Fiames (Cortina d'Ampezzo, BL)*", currently student in Msc Forestry and Environmental Sciencies

Graduated in 2012

2. Ruggero Alberti (Bsc in Land Defence and Preservation), "*Hydrogical modeling and wood transport of Val Scura and Rio Ri torrents in the province of Trento*", currently student in Msc Forestry and Environmental Sciencies

3. Gabriele Barban (Bsc in Land Defence and Preservation), "*Experimental study of two debris flows parallel pointing to a water stream*", currently student in Msc Forestry and Environmental Sciencies

4. Luca Romanel (Bsc in Land Defence and Preservation), "*Geo-Hydrological analysis of Rudavoi watershed and study of debris flow triggering conditions*", currently student in Msc Forestry and Environmental Sciencies

Graduated in 2011

5. Mauro Boreggio (Bsc in Land Defence and Preservation), "Simulation *of debris flows occurred the 4th of November 2011 on Rio Lazer watershed by using a cell model*", currently student in Msc Forestry and Environmental Sciencies

Graduated in 2010

6. Giacomo Crucil (Bsc in Forestry and Environmental Technologies), "*Monitoring debris flows*", Msc in Forestry and Environmental Sciencies and current felloship recipient

Graduated in 2006

7. Carlo Bortolami (Bsc in Land Defence and Preservation), "*Use of Hec-Ras to compute the water surface in a mountain streams: comparison between measured and simulated profiles*", currently draftman and designer (freelance)
8. Enrico De Gasperi (Bsc in Land Defence and Preservation), "*Set up of an experimental facility to study the failure of an homogeneos sediment dam",* currently employed in a civil construction society.
9. Carlo Stivanin (Bsc in Land Defence and Preservation), "*Design of an irrigation plan on the Euganei hills*", currently employed in an society of hydraulic-hydrologic modeling and water engineering.

Graduated in 2005

10. Mario Furlan (Bsc in Land Defence and Preservation), "*Measurements of woody debris deposited on the stream bed and trapped in check dams grids in a mountain catchment*", currently draftman and Msc Student in Forestry and Environmental Sciencies

Bsc Batchlor degree: 3 years degree
Msc Master degree: 5 years degree (till 2005) or 2 year degree after the Bsc (after 2005)

Professional Societies

Member, *International Association Hydraulic Research*, 2000-present

Research Topics

Hydrological modeling of headwater basins runoff
Monitoring runoff of headwater basins
Debris Flow:
1) monitoring debris flow initiation
2) analysis of triggering conditions and solid-liquid hydrograph computation
3) post-event surveys of occurred debris flow
4) estimation of erodible volumes along natural channel
5) estimation of deposited volumes on fans
6) monitoring debris flow routing phases
7) modeling of debris flow routing and deposition phases
8) laboratory experiments on triggering and uniform flow conditions
Sediment and Log Transport at high slopes
Failure of formed natural dams
Stream flow fluctuations in small alpine catchments
Velocity profile measurements at low submergence

Revision activity (2006-2015)

Journal Peer Reviewer

AGU - Journal of Geophysical Research (ES)
AGU - Water Resources Research
ASCE - Journal of Hydraulic Engineering
IAHR - Journal of Hydraulic Research
EGU - Natural Hazard and Earth System Sciences
Wiley - Hydrological Processes
Wiley - Earth Surface and Processes Landforms
Elsevier - Geomorphology
Elsevier - The Science of the Total Environment
Elsevier - Advanced Water Resources
Springer - Natural Hazard
Springer - Earth Science Informatics
Geophysical Journal International
International Journal of Sediment Research
Hydrology Sciences Journal
Bulletin of Engineering Geology and the Environment

International Conferences

28th IAHR Congress – Graz 22-27 August
Second International Conference on Debris Flow Hazards and Mitigation, Taipei, Taiwan 16-18 August 2000
Third International Conference on Debris Flow Hazards and Mitigation, Davos, Switzerland 10-12 September 2003
32th IAHR Congress Venice, 2-5 July.
Fourth International Conference on Debris Flow Hazards and Mitigation, Chengdu, China 10-13 September 2007
Fifth International Conference on Debris Flow Hazards and Mitigation, Padova, Italy 13-17 June 2011

Research Projects

2012-2015 Cariparo Funded Project GAPDEMM "GIS based integrated platform for debris flow monitoring, modelling and hazard mitigation". Partner Leader (55000 euro)

2011-2013 Internal Research Project Study of new alarm systems for hydrogeological risk and their socio-economic impact in an high value touristic area. Leader (22000 euro)

2010-2012 Internal Research Project Dynamic modeling of eco-systems: strategies for recovery and re-establishment. Participant

EU 2009-2012 Project: PARAMOUNT (imProved Accessibility: Reliability and security of Alpine transport infrastructure related to mountainous hazards in a changing climate). Partner and Thematic Working Group (debris flow) Leader (240000 euro)

EU 2000-2003 Project: Damocles (Debrisfall Assessment in MOuntain Catchments for Local End-userS). Participant.

EU Research Programme Enviroment and Climate 1994-1998 – Project: Eroslope II. Partecipant.

EU Research Programme Enviroment and Climate 1994-1998 – Project: Debris Flow management and risk assessment in the Alpine region. Participant.

TMR (Training Mobility Resarcher) program of EU (European Union), 1997
Contractor of the research project "*Access to large Scale Facilities*", at HR Wallingford (Sloping Duct Facility).

Summary of the research achievements and work in progress

1) The inception of sediment transport at high slopes

A model to estimate the mean flow depth at the inception of sediment transport is proposed after a verification by experimental tests. The model is based on the theoretical analysis at the limit equilibrium of a gravel particle at rest on the surface of a cohesionless sediment bed that is stressed by an uniform stream flow.

The theoretical analysis has been carried out through both the limit equilibrium translation (Gregoretti, 2008) and the limit equilibrium rotation about an axis passing through the contact points of the supporting particles (Pigozzi and Gregoretti, 2007). Both the procedures lead to a relationship between the mean flow depth and the sediment size that depends on the bed slope angle, the exposure of the particle to the stream flow and its distance from the bottom after the introduction of a low-submergence velocity profile. In the case of the first procedure it depends even on particle repose angle. The flow depth computed by the relationships were compared with those of previous experimental tests carried out on nearly uniform size sediment beds. A satifasctory agreement between theory and experiment is achieved in the case of the first procedure but not in the case of the second one because of the simplified expression of the moment arms of the hydrodynamic forces that were used in the moment balance.

Further steps are the refinement of the mechanical expressions of the rotational equilibrium procedure and a wider series of experiments with a wider grain size distribution. If tested as suggested above, this model could be used to

estimate the initiation of debris flow: the removal of the largest particles mobilizes all the upstream finer particles increases noticeably the concentration of the transported sediment up to form a debris flow.

1) Triggering of debris flow by channel bed failure

The triggering of debris flows was initially studied in experimental flumes and slopes (Gregoretti, 2000a,b). Main outcome is that granular or coarse-grained debris flow is triggered by runoff that entrain the surface material and forms a solid-liquid wave. These experimental studies were followed by a field research combined with the modeling of the phenomenon. A seven years (2000-2007) field work combined with hydrological and sediment transport modeling allows to build a realistic scenario of the formation of 30 occurred debris flows due to channel-bed failure in six headwater basins of Dolomites. A methodology to predict the critical rainfalls and runoff discharge that triggered the occurred debris flows has been developed on the base of these realistic scenarios (Gregoretti and Dalla Fontana, 2008).
In particurlar the survey of the upper part of the basins allowed the recognition of the triggering areas of debris flow with the measurements of morphological characteristics and the sampling of surface bed material in such areas.
The comparison of the hydrological response obtained by a kinematic distributed model in the triggering areas with the time of occurrence of debris flows allowed to determine both the triggering rainfall and discharge. The triggering discharge resulted to be the simulated peak discharge. The triggering rainfall was established as the non-stop rainfall up to the time of occurrence that is the time of the simulated peak discharge. The triggering discharges were successfully compared with the critical values for the beginning of sediment transport at very high slopes, resulting larger than those obtained by a flume based data empirical relationship that is based on the mean diameter of the debris layer *to be mobilized* and the bed slope angle.
The critical rainfalls were separetely studied and two regimes were recognized: high intensity short duration precipitations and low intensity long duration precipitations (Gregoretti and Dalla Fontana, 2007a). The hyetographs of the first type of precipitation always show the presence of a burst that mostly contribute to the formation of the simulated peak discharge. The intensities of these rainfalls were then re-computed neglecting the initial and ending part with rain gauge samples inferior to 1 mm, corresponding to 12 mm/h, because they significatively influence the intensity but not the simulated discharge. Two rainfall thresholds based on the critical rainfall intensities were then developed, considering the intensities of the first regime precipitations and all the precipitations respectively. The first threshold was positively compared with rainfall-depth frequency curves corresponding to a return period of about three years (Gregoretti and Dalla Fontana, 2007b).

The weak parts in the results showed above are the distance between the rain gauges and the triggering areas that in some case is very long (up to 4 km), the precision of the time of occurrence that in some case is missing or approximate and, finally, the reliability of the adopted hydrological model. A new field work started in summer 2009 by placing rainfall gauges in upstream part of several basins routed by debris flows in the Boite valley ((Dolomites, North Easth Italy) and setting up three monitoring stations close to the initiation areas of hystorical debris flows at Dimai (2010-), Rovina di Cancia (2014-) and Punta Nera (2016-) triggering area of Dimai debris flow channel (Dolomites, North Easth Italy). Moreover, a station for measuring discharge (broadcrested weir) of runoff descending along a rocky channel incised on the cliffs of Dimai peak (Dolomites, North Easth Italy) was installed on August 2011 and, even destroyed or filled by sediment several times provided measurements of runoff hydrograph. Those corresponding to the period 2011-2014 were used to test a new hydrological model that is able to simulated the measured peaked runoff hydrographs.

On June 2013 another monitoring station was installed at Salvella Fork (2200 m a.s.l) for investigating the correlation between electrical charge before precipitation and rainfall intensity at the purpose to have a reliable short time prediction of the occurrence of debris flows.

Finally, a study of the triggering debris flow rainfalls is carried out by comparing the estimated radar and rain gauge measured rainfall depths, at the purpose to evaluate the weather radar potentiality for the real time providing of reliable estimates of rainfall able to trigger debris flows.

3) Elaboration of data of granular debris flow experiments carried out in laboratory flume

Data of a systematic set of flume experiments are analyzed to investigate the feature of velocity profiles and the behavior of sediment concentration and other relevant characteristics of flow (Lanzoni et al., 2017).

4) Geomorphic approach for determination of sediment volume mobilized by debris flows.

In summer 2009 a field campaign started to estimate the sediment volume that can be mobilized by debris flows along natural channels. The estimate of erodible sediment is obtained through the measurements of the morphological and sediments features of source areas and on their locations (channel bank or bottom). Topography of channel banks, cross-sections and thalweg, as the source areas and deposition area is measured both by LIDAR and direct GPS measuremeants with real time corrections to have a maximum vertical error less thn 3 cm. The estimate of volume of entrainable sediment is correlated to geomorphic characteristics of chanel and sedimentological characteristics of terrain to obtain a reliable relationship of potentially volume of sediments that can be mobilized during a debris flow event.

The field campaign will term in September 2011. A first elaboration of data (Degetto et al., 2011) has been accepted at the Fifth International Conference of Debris Flow Hazard and Mitigation that will be held in Padova on June 2011.

5) Cells model for the simulation of debris flow rouiting along a fan

A GIS-based cell model for simulating debris flow routing and depositon phases along a fan is built using uniform flow and weir discharge laws to simulate flow between cells. Entrainment and deposition of sediment is simulated adapting the empirical law of Egashira. The comparison of simulation results with the flooded area and sediment deposit depth corresponding to the debris flow occurred on Rio Lazer (Dolomites, Italy) is satisfactory (Gregoretti et al., 2010b, Gregoretti et al., 2011, Gregoretti et al., 2016a). Actually the model is being tested against other field data of occurred debris flows and is currently on revision to simulate debris flow routing just after the beginning where large entrainment phenomena occurs.

6) The failure of formed natural dams by laboratory experimental tests

A predictive relationship of the failure of an homogeneous dam of coarse sediments is searched as function of the dam and bottom geometry and of the sediment physical characteristics (Gregoretti et al. 2010).

The dimensional analyses provides the functional relationship and the dimensionless groups from which the phenomenon depends. A series of experiments of dam failure carried out in a laboratory facility allow to distinguish three different failure mechanisms depending on the downstream face slope angle. For lower values of it ($\approx 7°$) the dam failure is due to the overtopping. For downstream face slope angle values between 7 and 25° some sediment erosion take places on the slope with the forming of a channel that migrates upstream reaching the water impoundment. The meeting with the water impoundment origins a breach whose progressive erosion lead to the dam failure and the depletation of the reservoir. For larger values of the downstream face angle there is a general slide of the downstream of the face that increases its slope and after that a channel forms again and the failure take places as in the previous case.

The predictive relationship is searched for the second of the cases shown above. Failure dam experiments were performed varying the sediment size, the dam geometry for slopes ranging from 0 to 10%. The analyses of the experimental results proposes a linear dependence of the dimensionless critical reservoir level versus the bottom slope angle and the downstream face slope angle and a power law dependence versus the ratio height of the dam over median size of the material. The numerical constants of the linear and power law expressions from which the dimensionless

critical level depends are then searched by minimizing the norm of the errors between the data and those given by the expression itself. The spreading of data around the obtained relationship is within 4%.

Further steps are the increasing of the bed slope angle and the use of sediments of assorted granulometry as field investigations on natural formed landslide dams in the Alps.

7) GIS-based software for debris flow simulation

Within the European Project "PARAmount" an user friendly GIS-based software for debris flow simulation will be developed . This software groups four different modules. The first module is the hydrological model used by Gregoretti and Dalla Fontana (2008). The second module is a triggering model that estimates the capability of runoff to trigger debris flow along a channel and provides the debris flow hydograph. The third model is debris flow inundated area model (empirical-statistical model) given by Berti and Simoni (2007). The fourth model is a cellular automata model for debris flow routing and deposition (Deangelis, 2007). The output of the first module is the input of the second module. The output of the second module is the input of the third and fourth models. Actually only the first, second and third modules are operative and can be downloaded at the Paramount Web Site after e-mail request. The last module will be operative within July 2011.

Berti M., and Simoni A. (2007) Prediction of debris flow inundation areas using empirical mobility relationships. *Geomorphology*,90, 144–161.
Deangelis C. (2007) Laboratory Granular Flows generated by Slope Failures *Rock Mechanics and Rock Engineering*

Pubblications

Peer-reviewed papers

2000a **C. Gregoretti** *Experimental evidence from the triggering of debris flow along a granular slope*. Journal of Physical and Chemistry on Earth (B) Vo. 25 n. 4.

2000b **C. Gregoretti** *The initiation of debris flow at high slopes: experimental results***.** Journal of Hydraulic Research vol. 38 n. 2.

2001 **C. Gregoretti** *Influence of streamwise bed slope on sediment threshold under stream flow*. Discussion –vol. 127, n. 6 Journal of Irrigation and Drainage Engineering, ASCE.

2002 Borga M., Dalla Fontana G., **Gregoretti C**. and Marchi L. *Assessment of shallow landslide hazard by using a physically based model of hillslope stability*. Hydrological Processes vol. 16.

2005 Armanini A. and **Gregoretti C.** *Incipient sediment motion at high slopes in uniform flow condition*.**"** Water Resources Research, vol. 41, W12431 doi:10.1029/2005WR004001

2008 **Gregoretti C.** and Dalla Fontana G. *The triggering of debris flows due to channel-bed failure in some alpine headwater basins of Dolomites: analyses of critical runoff***.** Hydrological Processes, vol. 22, DOI: 10.1002/hyp.6821, pag. 2248-2263.

2008 **Gregoretti C.** *Inception sediment transport relationships at high slopes***.** Journal of Hydraulic Engineering, ASCE, 134, 11, 1620-1629.

2010 **Gregoretti C**., Maltauro A. and Lanzoni S. *Laboratory experiments on the failure of coarse homogeneous sediment natural dams on a sloping*. Journal of Hydraulic Engineering, ASCE, 136, 11, 868-879.

2015 Degetto M, **Gregoretti, C**., Bernard M. (2015) *Comparative analysis of the differences between using LiDAR and contour-based DEMs for hydrological modeling of runoff generating debris flows in the Dolomites*. Frontiers in Earth Sciences 3:21. doi: 10.3389/feart.2015.00021.

2016 Underwood S.J., Schultz M.D., Berti M., **Gregoretti, C**., Simoni A., Mote T.L., Hayser A., and Saylor A. (2016) *Atmospheric circulation patterns, cloud-to-ground lightning, and locally intense convective rainfall associated with debris flow initiation in the Dolomite Alps of northeastern Italy.* , 16, 509-528, doi:10.5194/nhess-16-509-2016

2016 **Gregoretti, C**., M. Degetto and M. Boreggio (2016a) *GIS-based cell model for simulating debris flow runout on a fan.* Journal of Hydrology, 534, 326-340 doi:10.1016/j.jhydrol.2015.12.054

2016 **Gregoretti C**., Degetto M., Bernard M., Crucil, G., Pimazzoni A., De Vido G., Berti M., Simoni A. Lanzoni S. (2016b) *Runoff of small rocky headwater catchments: Field observations and hydrological modeling*. Water Resources Research, 52(10) 8138-8158, doi:10.1002/2016WR018675

2017 Lanzoni S., **Gregoretti C.,** Stancanelli L. (2017) Coarse-grained debris flow dynamics on erodible beds. *Journal of Geophysical Research: Earth Surface, 122, doi:* 10.1002/2016JF004046

Papers at conferences

1997 G. Di Silvio e **C. Gregoretti** *Gradually varied debris flow along a slope.* First International Conference On Debris Flow Hazard Mitigations: Mechanics, Prediction and Assessment. ASCE -San Francisco - USA 7-9 August (oral presentation).

1999a D'Agostino V., **Gregoretti C.** e Lenzi M.A. *Initiation of motion and dimensionless critical shear stress in a steep mountain stream.* XXVIII IAHR Congress – Graz 22-27 August. (oral presentation).

1999b D'Agostino V., **Gregoretti C**. e Lenzi M.A. (1999) *Transport distances of marked cobbles in a steep mountain stream.* XXVIII IAHR Congress – Graz 22-27 August (oral presentation).

2000c **C. Gregoretti** *Estimation of the maximum velocity of a surge of debris flow propagating along an open channel***.** Interpraevent2000 – Villach 26-30 June.

2000 Armanini e **C. Gregoretti** *The triggering of debris flow: a comparison between theoretical mechanics and experimental result.* Second International Conference On Debris Flow Hazard Mitigations: Mechanics, Prediction and Assessment.. IAHR -Taipei - Taiwan 16-18 August. (oral presentation).

2003 Lenzi M.A., D'Agostino V., **Gregoretti C.** and Sonda D. *A simplified numerical model for debris-flow hazard assessment: DEFLIMO*. Third International Conference On Debris Flow Hazard Mitigations: Mechanics, Prediction and Assessment.. Davos – Switzerland 10-12 September.

2007 Pigozzi D., **Gregoretti C.** and Pontin M. *Limit rolling entrainment condition of sediment bed particles at high slopes***.** 32th IAHR Congress Venice, 2-5 July (oral presentation).

2007a **Gregoretti C**., Dalla Fontana G. (2007a) *Different regimes of critical rainfalls for debris flow initiation by channel-bed failure of Dolomites.* Geophysical Research Abstract 9. (oral presentation at EGU).

2007b **Gregoretti C.** and Dalla Fontana G. (2007b) *Rainfall threshold for the initiation of debris flows by channel bed failure of the Dolomites***.** Fourth International Conference On Debris Flow Hazard Mitigations: Mechanics, Prediction and Assessment.. Chengdu– Cina 10-13 September. (oral presentation).

2011 **Gregoretti** C., Furlan M. and Degetto M. "**GIS-based cell model for debris flow deposition on a fan**" Fifth International Conference On Debris Flow Hazard Mitigations: Mechanics, Prediction and Assessment Padua June 14-17 (oral presentation).

2011 Degetto M., Crucil G., Pimazzoni A., Masetto C. and **Gregoretti** C. "**An estimate of debris flow volume entrainable by debris flows at Ravina di Cancia (Dolomites, Italy)**" Fifth International Conference On Debris Flow Hazard Mitigations: Mechanics, Prediction and Assessment, Padua June 14-17 (oral presentation).

2011 Deangelis C., **Gregoretti C**., Paltrinieri E., Rabuffetti D. and Tiranti D. "**An integrated approach to simulate channelized debris flows fron triggering to deposition**" Fifth International Conference On Debris Flow Hazard Mitigations: Mechanics, Prediction and Assessment Padua June 14-17. (oral presentation).

2015 **Gregoretti** C., Bernard M., Degetto M., Berti M. Simoni, Lanzoni S. "**The hydrological response of a rocky head water basin to convective rainfalls**" EGU General Assembly Vienna April 12-17 (oral presentation).

2015 Berti, M., **Gregoretti, C**. and A. Simoni **"Observation of the hydrologic response in the source area of a debris flow catchment"** Sixth International Conference on Debris Flow Hazards Mitigation, Tsukuba (Japan), June 22-25 (poster presentation).

2015 Boreggio M., **Gregoretti** C., Degetto M., "**Occurred debris flows in North-Eastern Italian Alps: documentation and modeling** " 10th Alexander von Humboldt Conference Addis Abeba November 18-20 (oral presentation).

2016 Lanzoni S. **Gregoretti** C. "**Non-local rheology of stony debris flow propagating over a cohesionless sediment bed** " EGU General Assembly Vienna April 17-22 (oral presentation).

papers in edited books

2000d M. Borga, G. Dalla Fontana & C. **Gregoretti** *A coupled hydrologic-geomorphologic model of hillslope stability for shallow landsliding.* "New Trend in water and environmental engineering for safety and life: Eco-compatible solutions for aquatic environments" A. A. Balkema publishers, Rotterdam.

2005 Vezzani C, **Gregoretti C** (2005) *Spring and summer transpiration from water stream banks and daily stream flow fluctuations in a small alpine catchment.* Technical Documents in Hydrology, N. 77, Unesco, Paris, Unesco Working Series SC-2005/WS/56, 83-88

National-reviewed papers (in italian)

1998 **C. Gregoretti *"Fronte di debris flow: composizione e celerita' ".*** "L' Acqua" vol6/98.

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1996 **C. Gregoretti *"Osservazioni sperimentali sulle colate detritiche".*** XXV Convegno di Idraulica e Costruzioni Idrauliche - Torino - 16-18 Settembre. (oral presentation)

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2002 Gregoretti C *"Indagine sperimentale di un moto di filtrazione a superficie in regime non lineare*. XXVIII Convegno di Idraulica e Costruzioni Idraulica - Potenza – 16-19 Settembre. (oral presentation)

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2008 Maltauro **A.**, Lanzoni S. e **Gregoretti C.** "**Quota critica di invaso per il collasso di uno sbarramento omogeneo di materiale incoerente in un alveo inclinato**". XXXI Convegno di Idraulica e Costruzioni Idrauliche – Perugia 8-13 Settembre (oral presentation)

2010b **Gregoretti C**., Furlan M., and Di Raimondo D. "Modello a celle a base GIS per simulare eventi di colata detritica" XXXII Convegno di Idraulica e Costruzioni Idrauliche – Palermo 14-17 Settembre (oral presentation)

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2012b **Gregoretti C**., Degetto M. "**Modello di innesco di una colata detritica originata dall'erosione di sedimenti per deflusso superficiale e dell'idrogramma solido-liquido**" XXXIII Convegno di Idraulica e Costruzioni Idrauliche – Brescia 10-15 Settembre (poster presentation)

2012c **Gregoretti C**., Degetto M., Crucil G., Pimazzoni A., Berti M., Simoni A, De Vido G. "**Monitoraggio dei deflussi superficiali in un canale roccioso inciso sul campanile Dimai a Fiames (Cortina d'Ampezzo, BL): analisi preliminari**" XXXIII Convegno di Idraulica e Costruzioni Idrauliche – Brescia 10-15 Settembre (poster presentation).

2014 Crucil G. , Pimazzoni A., Bernard M., Degetto M**., Gregoretti C.** , Lanzoni S. *Installazione di uno stramazzo a monte della zona di formazione delle colate detritiche per la misura delle portate che le innescano* XXXIV Convegno di Idraulica e Costruzioni Idrauliche – Bari (oral presentation)

2014 Fent I., Stancanelli L., Canestrelli A., **Gregoretti C.,** Lanzoni S. *Modellazione di colate detritiche ai volumi finiti: simulazione della fasi iniziali di erosione e di transizione dalla fase liquida al miscuglio solido-liquido* XXXIV Convegno di Idraulica e Costruzioni Idrauliche – Bari (oral presentation)

2014 Degetto M., **Gregoretti C**., Mezzomo R, Soppelsa L. *La messa in sicurezza dell'abitato di Chiapuzza (S.Vito di Cadore, BL) dal rischio di colata detritica*. XXXIV Convegno di Idraulica e Costruzioni Idrauliche – Bari (poster presentation)

2016 Bernard M., Stancanelli L., Berti M., Simoni A., **Gregoretti C**., Lanzoni S. (2016) *Field results from the runoff generated debris flows occurred at Rovina di Cancia (Venetian Dolomites)* XXXV Convegno di Idraulica e Costruzioni Idrauliche – Bologna (oral presentation)

2016 Boreggio M., Bernard M., Degetto M, **Gregoretti C**., Alberti R. (2016) *Potenzialità di un modello a celle per la simulazione di eventi di colata detritica.* XXXV Convegno di Idraulica e Costruzioni Idrauliche – Bologna (oral presentation)

Main Institutional Techinical Works

1) 2D flood simulation along Cormor River using the code RMA2 at the purpose of testing the hydraulc functionality of the new bridges of the ring road of the town of Udine (North-East Italy).
2) Hydrologic, Hydraulic and sediment transport study along Auernig torrent (North-East Italy) at the purpose of the design of civil works against hydrogeological risk.
3) Modeling of sediment transport along Sangro River (Central Italy) at the purpose of the design of civil works against the hydrogeological risk in the Sangro watershed.
4) 2D flood simulation along a 15 km reach of Fiume River (North-East Italy) using the code Basement at the purpose of inverstigating the hydraulic functionality of the new planned bridges of district road n. 9.
5) 2D flood simulation and overflow basin along Cormor torrent (North-East Italy) using the code Basement at the purpose of inverstigating the hydraulic functionality of the modified plan of the new bridges of the ring road of the town of Udine and overflow basin.
6) 2D flood simulation along Colvera torrent (North-East Italy) using the code Basement at the purpose of inverstigating the possibility of sediment extractive works.
7) 2D flood simulation along a 21 km reach of Fiume River (North-East Italy) using the code Basement at the purpose of inverstigating the hydraulic functionality of bridges of motorway A22 and the flooded area in the municipality of Cimpello.
8) Hydrological Risk assessment and debris flow hazard mitigation at Chiapuzza village (February 2013-)

9) Hydrological Risk assessment and debris flow hazard mitigation at Ravina di Cancia (October 2013-March 2015).
10) Hydrological and Hydraulic modeling of debris flow occurring at Rovina di Cancia (April-September 2015).
11) Functional analysis of an open check dam for debris flow occurrence by hydraulic modeling (February 2016).

Main Private Works

1) Techinical report for private actors in the Civil Case against the muncipality of Pordenone (North-East Italy) for the failure of the sewer system that caused the flooding of some urbanized areas the 25th of November 1990 (1 million euro damage assessed just after the event) with positive results: the Case has been won (May 2012).
2) Teacher (26 hours) of the Course " Design of walls in agricultural and forestry environment according to the new technical rules of 2008" for the Association of Forestry and Agricoltural Practitioner of Province of Trento (North-East Italy) (March-June 2013).
3) Techinical report for the mayor of Borca di Cadore (North-East Italy) in the Penal Case for people dead after the debris flow occurred the 18th of July 2009. The Case has been won (May 2013).
4) Hydrologic and Hydraulic modeling of debris flows threatening the Regional Road 348 "Feltrina", hazard map and proposal for an early warning system (7/3/2015).
5) Teacher (4hours) of a Short Course on Debris flow for the Engineer Association of Belluno (11/6/2015).
6) Teacher (5hours) of the a Short Course on Debris flow for the Engineer Association of Pordenone (3/4/2016).
7) Techinical report for the staff of the Public Work Department of Veneto Region in the Penal Case for people dead after the debris flow occurred the 18th of July 2009 at Borca di Cadore (North-East Italy).