

# EARTH SCIENCE, RECYCLING & SPACE TECHNOLOGY

Keynote Forum | Day 1

May 22-23, 2019 | Rome, Italy

Nicolas H Younan, J Environ Waste Management and Recycling 2019, Volume 2



## Nicolas H Younan

Mississippi State University, USA

### BIOGRAPHY

Nicolas H Younan is the Department Head and James Worth Bagley Chair of Electrical and Computer Engineering at Mississippi State University. He received the B S and M S Degrees from Mississippi State University, in 1982 and 1984 respectively, and the PhD degree from Ohio University in 1988. He has been involved in the development of advanced signal processing and pattern recognition algorithms for data mining, data fusion, feature extraction and classification and automatic target recognition/identification. He has published over 300 papers in journals, referred conference proceedings and book chapters. He is a senior member of IEEE and a member of the IEEE Geoscience and Remote Sensing society, serving on two technical committees: Image Analysis and Data Fusion, and Earth Science Informatics (previously Data Archive and Distribution). He has served as the Chair, Co-Chair and as an Editor for various national and international conferences and workshops.

[younan@ece.msstate.edu](mailto:younan@ece.msstate.edu)

### INFORMATION RETRIEVAL FROM EARTH OBSERVATION (EO) IMAGERY

Earth Observations (EO) data are obtained from a multitude of sources and requires tremendous efforts and coordination among researchers and user groups to come to a shared understanding on a set of concepts involved in a domain. The ultimate goal of any EO system is to provide understanding, which will often require expertise and/or data sources from globally distributed resources, thus presenting unique challenges. To address these challenges, it is incumbent upon the global community to evolve and sustain a global observation network. These observations serve as the foundation for the models that are used to describe Earth processes. As this observational data accumulates in global archives, new opportunities become available for knowledge discovery about the Earth system. However, access to these observational data is optimized for the science teams for whom the instruments were launched and access by operational users may be problematic. This presentation will lay out some of the challenges for those engineers and scientists involved in pattern recognition in the Earth remote sensing arena. It describes the problem space for making decisions and introduces the concept of contextual remote sensing.

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## Y Cengiz Toklu

Beykent University, Turkey

### BIOGRAPHY

Y Cengiz Toklu did his BS, MS in Civil Engineering, Middle East Technical University, Turkey in 1967 and 1969; Dr. Ing. Institut de Mecanique Theorique et Appliquée, Faculté des Sciences, Université Paris VI (Pierre et Marie CURIE), Paris, France, 1976. His current research interest is in Optimization in engineering, nonlinear structural analysis, construction project scheduling, space civil engineering and engineering education. He is the creator of the method "Total Potential Optimization using Metaheuristic Algorithms (TPO/MA)" which gives very successful results in analyzing nonlinear and degenerate structural systems. Currently he is working on a project that aims at producing lunar soil simulant in Turkey.

[cengiztoklu@gmail.com](mailto:cengiztoklu@gmail.com)

### SPACE HABITATIONS, TECHNICAL ASPECTS AND INTERNATIONAL COOPERATION

Being terrestrial for some millions of years, humanity is now advancing in the direction of being extra-terrestrial. Attempts made until now have all been successful, walking on the Moon, and living in stations for month's miles away from earth. In the coming decades, it is easily predictable that men will spend time on Moon in lunar shelters for periods longer than "Short visits". This will be followed by going to Mars and other space bodies. Such achievements will be realized thanks to space research conducted in space agencies all around world, especially by countries who can afford huge amounts of money in this field. In fact, space research is a multi-dimensional, multi-disciplinary field where important contributions can be made without having much financial support. Such an approach, evidently, will increase international cooperation in the field and will help increasing technological and scientific levels of all countries that join this research subject. Designing shelters specially adapted to lunar environmental conditions, and finding ways of construction techniques for building them but a field where many researchers from many countries can attack; A related field is producing lunar soil simulants on earth and making experiments on them for using lunar soil as the only in situ resource available in construction and for extracting other compounds and elements that will be needed for human survival on Moon. It is to be noted that up to date nine countries have produced lunar soil simulants and this number is increasing continuously. It is remarkable also that among these countries there are some who cannot be classified as financially very strong capable of sending probes to Moon or Mars or even to Earth's orbit. This proves the feasibility of conducting space research internationally with as much as countries and organizations on Earth.

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## Joachim Quoden

EXPRA-Extended Producer Responsibility Alliance, Belgium

### BIOGRAPHY

Joachim Quoden has extensive experience in packaging and municipal waste management, dating from 1992 when he spent four months in the German Ministry of Environment working on packaging issues including the German Packaging Ordinance. From 1993 to 2006, he worked with Der Grüne Punkt - Duales System Deutschland GmbH (DSD), where he was appointed Head of International Affairs in 2001. He acts as Managing Director of EXPRA, a new alliance of 25 PRO's from currently more than 23 countries since 2013. He is working as independent lawyer in Germany specializing in international EPR legislation since 1995; Chairperson of ISWA's Governance & Legal WG; Member of the OECD EPR expert group and has served as an expert in ISO global standardisation project SIS/TK 165/AG 10 Packaging and Environment. He also became Secretary General between 2001 and 2013, later Managing Director of PRO EUROPE-the umbrella organisation of 35 packaging recovery organisations.

[joachim.quoden@expira.eu](mailto:joachim.quoden@expira.eu)

### EXTENDED PRODUCER RESPONSIBILITY AS TOOL ON THE WAY TO THE CIRCULAR ECONOMY

The European Union has decided to move from a linear business approach to a circular economy. A circular economy is a regenerative system in which resource input and waste, emission and energy leakage are minimized by slowing, closing, narrowing energy and material loops; this can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, recycling and upcycling. This is in contrast to a linear economy which is a 'take, make and dispose' model of production. Extended producer responsibility (EPR) is a policy tool to direct companies the way into this circular thinking by passing the responsibility for the end of life management of their used products to those companies putting packaged products on the market. The presenter will explain this concept by highlighting best practices in the packaging sector, taking also into account the new obligations for the 28 EU Member States coming from the circular economy package, including higher recycling targets and new minimum requirements for EPR systems.

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Yuri Yevdokimov, J Environ Waste Management and Recycling 2019, Volume 2



## Yuri Yevdokimov

University of New Brunswick, Canada

### BIOGRAPHY

Yuri Yevdokimov is a Professor at the University of New Brunswick, Canada. Having completed degrees in Economics and Engineering, he holds a joint appointment in the Departments of Economics and Civil Engineering. He acquired his degrees in three different countries: MSc equivalent in Engineering and PhD equivalent in Economics, former Soviet Union; MSc in Economics, USA and PhD in Economics, Canada. His research interests lie in the field of economic evaluation of climate change impacts, sustainable energy and emerging market economies. His work has been published in academic journals and conference proceedings in USA, UK, Canada, France, Greece, Germany, India, China, Croatia and former USSR, particularly in Russia and Ukraine. Till date he has more than 30 publications. One monograph, three textbooks, sixteen refereed journal articles and nine chapters in books are among these publications.

[yuri@unb.ca](mailto:yuri@unb.ca)

### ECONOMETRIC ANALYSIS OF THE LINK BETWEEN EXTREME WEATHER EVENTS AND CLIMATE CHANGE IN ATLANTIC CANADA

In recent years Atlantic Canada has seen many examples of extreme weather and climate events such as floods, hurricanes, thunderstorms, severe rainfalls and snowstorms, storm surges, heat waves and others. These extreme weather events resulted in significant economic damage which has affected lives of people in the region as well as public finances. The existing literature on extreme weather and climate events claims that frequency and magnitude of these events are going to increase in the future due to changing climate. This study tests this statement with respect to Atlantic Canada by means of a rigorous statistical analysis. The relationships between frequencies of floods, hurricanes, heavy rainfalls and snowstorms and climate variables such as temperature, precipitation and sea level are established on the basis of log-log complimentary model and Poisson regressions. Other specific factors associated with each extreme weather event are used as control variables. Our estimation on the basis of these statistical methods has shown a strong and statistically significant positive correlation between frequencies of the above mentioned extreme weather events and climate variables which prove the link between frequencies of these events and climate change in Atlantic Canada.

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Hasan Baylavli, J Environ Waste Management and Recycling 2019, Volume 2



## Hasan Baylavli

Hitit University, Turkey

### BIOGRAPHY

In this study, recycling aggregates were obtained from polypropylene fiber-reinforced concrete produced in different types and proportions. Polypropylene fiber-reinforced welding concrete was broken in a jaw crusher at the end of 120 days and recycling aggregates of 0-4mm, 4-15mm and 15-22mm, 4mm dimensions were obtained. With the polypropylene fiber-reinforced recycling aggregates obtained, concrete is produced again. Polypropylene fiber reinforced aggregate recycling concrete has been added in two different ratios of steel fiber. Steel fiber reinforced concrete produced has been awaited for three years in the laboratory environment. The compressive strength, tensile splitting strength, elasticity modulus, bending strength and bending strength deformation of the suspended concrete were investigated. The compression, tensile splitting and bending strength and the modulus values of elasticity have increased slightly depending on the time. The abrasion and water imbibition values of hardened concrete samples were also measured. The addition of steel fiber has improved abrasion strength. The water imbibition ratio has also increased with the addition of steel fiber.

[hasanbaylavli@hitit.edu.tr](mailto:hasanbaylavli@hitit.edu.tr)

### TEMPORAL CHANGES IN MECHANICAL PROPERTIES OF STEEL FIBER REINFORCED AND POLYPROPYLENE FIBER REINFORCED AGGREGATE RECYCLING CONCRETE

In this study, recycling aggregates were obtained from polypropylene fiber-reinforced concrete produced in different types and proportions. Polypropylene fiber-reinforced welding concrete was broken in a jaw crusher at the end of 120 days and recycling aggregates of 0-4mm, 4-15mm and 15-22mm, 4mm dimensions were obtained. With the polypropylene fiber-reinforced recycling aggregates obtained, concrete is produced again. Polypropylene fiber reinforced aggregate recycling concrete has been added in two different ratios of steel fiber. Steel fiber reinforced concrete produced has been awaited for three years in the laboratory environment. The compressive strength, tensile splitting strength, elasticity modulus, bending strength and bending strength deformation of the suspended concrete were investigated. The compression, tensile splitting and bending strength and the modulus values of elasticity have increased slightly depending on the time. The abrasion and water imbibition values of hardened concrete samples were also measured. The addition of steel fiber has improved abrasion strength. The water imbibition ratio has also increased with the addition of steel fiber.

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Henry Jiménez, J Environ Waste Management and Recycling 2019, Volume 2



## Henry Jiménez

Valle University, Colombia

### BIOGRAPHY

Henry Jiménez has completed the Agricultural Engineering studies from the National University of Colombia and the Valle University, completed his MSc at Clemson University, USA and has any other water resources and land management related courses in Russia, Japan, Egypt and USA. He is a Professor at engineering undergraduate programs and water resources management and sustainable development graduate programs at the Valle University, he is the Member of the Soil and Water Resources Research Group. He has over 50 publications and textbooks, also participated in different conferences and meetings and has been a member of different technical societies related to water resources, hydrology, climate, agricultural engineering and watershed management. He has been serving in the Colombian Education Ministry in order to evaluate the fulfilment of quality requirements for graduate and undergraduate programs. He has served as a Consulting Expert for Environmental Authorities and for the Watershed Management Agency.

[henry.jimenez@correounivalle.edu.co](mailto:henry.jimenez@correounivalle.edu.co)

### USE OF SATELLITE AND REMOTE SENSING TECHNOLOGY IN WATER RESOURCES AND LAND MANAGEMENT IN COLOMBIA

In the management of water resources and in the development of land in Colombia, aspects related to the monitoring, study, management and regulation of water and land have been improved with the use of satellite information and remote sensing technology. In terms of monitoring, progress is recognized through the implementation of monitoring networks using sensors, equipment and technology, which allow for real-time information on the conditions of the atmosphere, the level of the rivers and bodies of water. As well the rapid changes that occur in the use of the territory, with the existence of satellite information has been managed to improve the quality and availability of the cartography of most of the territory of the country. The information related to the knowledge of the territory and of the water resources, is employed in the decision making, such as the establishment of different programs and activities. Also, this spatial information becomes basic in the establishment of water resources management plans, watershed management plans and other lands planning and management instrument development. The impacts that occur in the Colombian territory, due to the variability and the climatic change, together with the great changes and pressure on the lands, are becoming stronger and it is necessary to improve the control, planning and governance of the land and water resources. Among the aspects that are necessary to improve in the country are: capacity of the government to attend and address the development requirements throughout its territory, training campaigns at all levels in the society with regard to the management of its natural resources, to complete and improve the level of technology use and coverage and to give a better use to the monitoring and information systems.

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Anette Mueller, J Environ Waste Management and Recycling 2019, Volume 2



## Anette Mueller

IABG GmbH, Germany

### BIOGRAPHY

Anette Mueller worked as Full Professor for "Processing and Re-Use of Building Materials" during 1995–2011. She worked as a Senior Scientist at the IAB Weimar Institute of Applied Construction Research since 2011. She was the Visiting Professor at the University of Illinois Urbana-Champaign, US in 2001 and at the University of Sao Paulo in 2015. Her basic research projects and a large number of applied research projects had been proposed and processed during the time as Full Professor. Her recent research activities in the field of recycling of Construction and Demolition Waste are Recycling of heterogeneous recycled aggregates as raw material of lightweight aggregates; Carbonisation as tool to improve the properties of recycled concrete aggregates; Microwaves as tool for the liberation of connected building materials; Liberation and sorting of masonry rubble and Gypsum in Construction and Demolition Waste. She has more than 300 scientific articles in international and national scientific journals.

[a.mueller@IAB-weimar.de](mailto:a.mueller@IAB-weimar.de)

### RECYCLING-THE UNDERESTIMATED CHALLENGE

Construction is impossible without building materials. Thus, a building material history can be written parallel to the construction history. The first building materials were not or only mechanically modified natural materials with limited design and low structural engineering potential. Today building materials are needed, which are continuously developed driven by quality and environmental requirements. The innovative nature of the building materials industry is demonstrated by R&D spending, which mainly relates to process innovations and product innovations. An increase in both the number and the complexity of the building materials can be observed. The last life cycle phase, the recyclability, i.e. the potential for circulation is not considered and only used in some cases as a product feature. The traditional materials concrete and reinforced concrete are easy to recycle. After processing, they can be used as recycled aggregates or as road building materials. However, additional components or recipe developments may decrease the good recyclability. As examples very fine-grained concretes or concrete with fiber reinforcement can be named. Masonry materials like clay brick, calcium silica brick or aerated autoclaved concrete, which are the main constituents of masonry rubble, are the real challenge for the recycling today. Either these material mixtures will be sorted by sensor based techniques. Then the sorted materials can be used as partial substitute of the raw material for the original products or with respect to their special properties. As alternative possibility the unsorted mixture can be used as raw material for the manufacturing of lightweight aggregates by means of a thermal process. These aggregates can replace natural lightweight materials like pumice.



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Ravi Vital Kandisa, J Environ Waste Management and Recycling 2019, Volume 2



## Ravi Vital Kandisa

Gandhi Institute of Technology and Management-GITAM, India

### BIOGRAPHY

Ravi Vital Kandisa completed his master degree in the field of Biotechnology from GITAM University, India and worked at Krebs Biochemicals and Industries Ltd., as a Junior Officer in the R&D for more than a year. He finished his MBA from Andhra University and worked at Biotechnology Industry Research Assistance Council (BIRAC), set up by Department of Biotechnology (DBT), Government of India as a Manager for Incubation and Technology Transfer, Commercialization & Communication. Currently, he is pursuing his PhD and guiding two students at postgraduate level and more than five students in bachelor degree. His current research is under Dr Narayana Saibaba KV in the area of Environmental Biotechnology and his research work mainly focused on Textile industry dye removal process by adsorption process. He has attended more than 20 national and international conferences and has published over five publications in international journals.

[vittubiotech@gmail.com](mailto:vittubiotech@gmail.com)

### METHYLENE BLUE DYE REMOVAL USING NATURAL LOW COST ADSORBENT: ADSORPTION ISOTHERM STUDIES

Textile industry is one of the fast growing industrial sectors which are consuming and polluting large volumes of water. Four isotherms Langmuir isotherm, Freundlich adsorption isotherm, Tempkin isotherm and Dubinin–Radushkevich isotherm were studied to evaluate the adsorbent efficiency in removal of methylene blue dye from textile industry waste water. Among all the isotherms named Freundlich adsorption isotherm was found to be the best fit model with regression value of  $R^2 \geq 99$ . Isotherm studies proved that *Vigna Trilobata* pod can be used as a natural low cost adsorbent for removal of methylene blue dye.