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Venice International University International PhD Academy | Global Challenges series WATER

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Monday May 8

9:00 – 10:30 WELCOME

Umberto Vattani, President of Venice International University (Italy)

Carlo Giupponi, Dean of Venice International University (VIU/Ca' Foscari University, Italy)

Alain Boudou, Scientific Coordinator (Bordeaux University, France)

Presentation of the participants
Presentation of the program
Practical arrangements



10:30 – 12:30 – WATER ON EARTH

Gabrielle de Lannoy (KU Leuven, Belgium)

Water is everywhere on Earth. This introductory lecture will discuss the distribution of water around the globe in its different physicochemical states (liquid, solid, vapor), and methods to estimate the amounts of water in the various compartments of the Earth. Special attention will be devoted to estimating water in the surface soil layers, vegetation, snow, and groundwater via remote sensing observations, modeling and data assimilation.

Short CV:

Gabrielle De Lannoy is an associate professor at the Catholic University of Leuven (KU Leuven) in Belgium. She is an expert in land surface observations, modeling and data assimilation and previously worked at NASA Goddard Space Flight Center, MD, USA as a senior researcher. She has been involved in the assimilation of various satellite data (e.g. SMOS, SMAP, GRACE, ...) into various land surface models to improve estimates of soil moisture, snow, vegetation, freeze/thaw, etc. She received her PhD in 2006 from the Ghent University (UGent) and received several national and international awards in recognition of her research.



14:00 – 16:00 – ECOLOGY OF AQUATIC SYSTEMS (marine and estuarine environments)

Laure Carassou (LabEx COTE, University of Bordeaux - Irstrea, Bordeaux, France)

Coasts and estuaries - diverse systems and multiple drivers : definition of coastal seas and estuaries ; geomorphological classification of estuaries ; physico-chemical properties.



Natural communities in coastal and estuarine waters: major groups of flora and fauna, focus on migratory fishes, estuaries and fisheries. Major human-induced stresses on coastal seas and estuaries: fishing, habitat fragmentation, pollution, water supply in estuaries ... 'Hot topics' of biological research in estuaries; the importance of transdisciplinary research for the management of estuarine and coastal marine systems.



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Short CV:

Laure Carassou is researcher at the national Research Institute for Science and Technology in Environment and Agriculture (Irstea). Her research interests focus on the response of aquatic communities to environmental factors at various spatial and temporal scales. She has developed research on the spatial and temporal structure of fish and plankton assemblages in coastal seas, and also studies the trophic dynamics of key fish species in estuarine ecosystems. She has a particular interest into biochemical tracers for elucidating resource pathways in trophic food webs such as stable isotopes and fatty acids. She also uses multivariate statistics allowing the identification and ranking of factors driving the composition of biological assemblages. Besides her research activities in aquatic ecology at Irstea, she also co-leads the research program of the Labex Cote Integrative and Theoretical Ecology Chair, in particular through collaborative projects lying at the frontiers among quantitative geography, ecology and social sciences.

16:00 – 17:30 – EXTREME EVENTS IN COASTAL AREAS

Marco Marani (Duke University, USA – University of Padova, Italy)

Changing extremes are an important aspect of anthropogenic and natural environmental change. In this seminar, I will discuss the general statistical theory that describes extreme events in a broad family of Earth's system processes, accompanied by specific applications to the evaluation of storm-surge frequency and magnitude under sea level rise. Case studies for several coastal sites of global interest will illustrate the use of the theory.



Short CV:

Marco Marani obtained his Master's Degree in Engineering at the University of Padova in 1993. In 1997 he received his PhD in Hydrodynamics and joined the faculty there as an Assistant Professor. In 2011 he moved to Duke University as a Professor, with a joint appointment in the Pratt School of Engineering and in the Nicholas School of the Environment. Since 2012 he is also a Professor at the University of Padova. His research interests include fluvial geomorphology, hydro-meteorology, flow and transport in the hydrologic cycle, eco-geomorphology of coastal areas, remote sensing, hydrologic drivers of disease vectors. He is a member of the Venice Academy of Sciences, Literature, and Arts, of the American Geophysical Union, and of the European Geosciences Union.

17:30 – 19:00 – GENERAL DISCUSSION

Tuesday May 9

9:00 – 10:30 – FROM THE WATERSHED TO THE SEA: NUTRIENT CASCADE AND EUTROPHICATION

Gilles Billen (CNRS- Pierre and Marie Curie University – Paris, France)

Nutrient pollution of groundwater, surface water and marine ecosystems remains a major environmental threat in spite of large efforts devoted in developed countries to reduce its causes and effects. A systemic approach to these problems leads to the conclusion that only a radical change in the water-agro-food system at the regional and global scale will be required to solve them.



Short CV:

Gilles Billen got his PhD at the University of Brussels in 1976, where he later headed the Group of Aquatic Environmental Microbiology for 15 years, devoted to the study of microbial processes in estuarine and marine areas, in connection with the cycles of carbon and nutrients.



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In 1997, he moved to Paris, and joined the CNRS, for taking, until 2007, the direction of the National Research Program on the Seine River (PIREN-Seine). He played a leading role in the development of biogeochemical modelling tools, aimed at testing scenarios for water resources management. He also participated in various international forums, such as the SCOPE-UNESCO Global NEWS program and the NinE (Nitrogen in Europe) ESF Network, and participated to the editorial team of the European Nitrogen Assessment. He is now conducting interdisciplinary research devoted the modelling of nutrient transfer between agricultural land and hydrosystems, at various scales from farm and landscape scale to regional or global scale. He is teaching a course on Territorial Biogeochemistry in the Master "Science of the Universe and the Environment" at University Pierre et Marie Curie in Paris.

11:00 – 12:30 – POTABILITY OF WATER RESOURCES: A CRUCIAL ISSUE

Xavier Litrico (*Suez Environnement-Lyonnaise des Eaux, Bordeaux, France*)

Water is an essential and critical resource for mankind. It is sparsely distributed on earth: freshwater, which is used for drinking water supply is not always available in quality and quantity to satisfy the needs. Water therefore has to be treated and transported to be drinkable. The talk will focus on water quality issues for drinking water supply, as well as the interaction with the management of the drinking water network. Examples taken from SUEZ experiences in various countries will illustrate the talk.



Short CV:

Xavier Litrico is a graduate from the Ecole Polytechnique, and the Ecole Nationale du Génie Rural, des Eaux et des Forêts. He holds a Ph.D. in Water Sciences and an Habilitation à Diriger des Recherches in Control Engineering. He spent the first part of his career as a researcher in the public sector (Irstea, formerly Cemagref, the French Public Research Institute on Environmental Engineering, Inria and UC Berkeley). Since 2011, he has been with SUEZ Water France (ex-Lyonnaise des Eaux), a leading firm in the water business. Dr. Litrico is director of LyRE, the R&D center of SUEZ in Bordeaux University, which develops research project in collaboration with academic partners on water related issues. With a team of 40 people, LyRE participates in more than 20 projects in partnership with academic researchers, around 4 research themes: water networks, water stakeholders and users, environment, data science.

Deeply rooted in the Aquitaine region, LyRE also operates at the national and international level on its domains of expertise for SUEZ.

Since 2015, Dr. Litrico is also scientific director for the digital, environment and customer relations direction of SUEZ Water France.

14:30 – 16:30 – IMPACT OF CLIMATE AND ANTHROPOGENIC CHANGES ON WATER RESOURCES MANAGEMENT

Emmanuel Reynard (*University of Lausanne, Switzerland*)

Climate change (changes in precipitation regime, temperature warming) is influencing both water resources (changes in hydrological regimes, increased evapotranspiration) and water demands (in particular due to the development of new needs (e.g. artificial snowmaking in mountains, irrigation of golf courses or building cooling). Modeling water management in the future also needs to take into account changes in anthropogenic systems. Based on several case studies carried out in the Alps and in the Mediterranean area, this presentation will focus on the need of integrated modelling systems.



Short CV:

Emmanuel Reynard is Professor of Physical Geography at the Faculty of Geosciences and Environment, University of Lausanne, Switzerland. His research interests concern various aspects of Water Resources Management, including prospective analysis of water management changes under climatic and anthropic drivers, water uses management and water demand modeling, water-related hazard assessment, and institutional and social issues concerning water management. He is also working on geomorphological heritage assessment and mapping, and geotourism. He carries out projects in several countries, including Switzerland, Brazil, Morocco, Tunisia and Romania. He is an active member of several national and international associations, including the Swiss Committee for Hydrology (Swiss Academy of Sciences) and the International Association of Geomorphologist (member of the Executive Committee).

17:00 – 18:30 – GENERAL DISCUSSION

Wednesday May 10



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9:00 – 12:00 Pollution of aquatic systems (1) – SYSTEMIC ECOTOXICOLOGICAL APPROACH BASED ON FRESHWATER SYSTEMS AND HEAVY METAL POLLUTION

Alain Boudou (University of Bordeaux, France)
with the participation of **Peter Campbell** (INRS University, Québec - Canada)

Contamination of natural systems results from actions and interactions between three sets of factors: abiotic (physico-chemistry of media), biotic (whole biological component) and contamination factors. They are characterized by a very great diversity with jointly a quasi-permanent variability in space and in time. The seminar will be based on a systemic approach at the level of continental aquatic ecosystems, based on different steps: sources of contamination (natural/anthropogenic), fate of contaminants in the water column, key role of sediment compartments, bioaccumulation at the organism scale, biomagnification along food chains and ultimately transfers to human populations with more or less severe toxicological damage. The discussion will be based on two toxic metals: mercury and cadmium.



Short CV:

Alain Boudou got his PhD at the University of Bordeaux 1 (Doctorate es-Sciences) in 1982, where he headed the team of Ecophysiology and Ecotoxicology of Aquatic Systems, member of the UMR EPOC (Bordeaux 1 University/CNRS). Author of more than 150 peer reviewed publications, 29 book chapters, 2 books (Aquatic Ecotoxicology: fundamental concepts and methodologies – CRC Press, USA). His research activities have been oriented towards the analysis of the mechanisms of contamination of aquatic systems by heavy metals (Hg, Cd), based on experimental laboratory models and jointly in situ studies.

He was elected President of the University of Bordeaux 1 “Sciences & Technologies” in 2005 and then President of the PRES “University of Bordeaux” in 2012 until his retirement in 2015.

14:30 – 16:00 – Pollution of aquatic systems (2) – EMERGENT ORGANIC POLLUTANTS: MYTH OR REALITY ?

Hélène Budzinski (CNRS, University of Bordeaux, France)

The preservation of water quality is a major issue for both the Environment and Human Health and it is thus important to characterize and comprehend the factors that can affect it. Amongst these factors is chemical contamination, with the aquatic environment being its ultimate sink. The knowledge concerning presence, pathways of introduction, sources of micropollutants in aquatic ecosystems, has considerably increased in recent years. Beside historical contaminants such as PCBs, PAHs, the concept of emerging contaminants has arisen in the past decade in relation with instrumental improvements. This presentation will present the status of current knowledge about these compounds on the analytical and environmental point of view. The presentation will discuss analytical developments and especially analytical challenges regarding these compounds (trace levels, complex mixtures and matrices) and will debate the source, introduction pathways and fate in the environment, highlighting related challenges and need of future developments.



Short CV:

Hélène Budzinski (51 years old – HIndex 45) is a CNRS research director and in charge of the LPTC (Laboratory of Physico- and Toxic-Chemistry of the environment) which is a research group of EPOC Laboratory (UMR 5805 University Bordeaux 1/CNRS). She is co-director of LabEx COTE. She is an environmental chemist. Her research focuses on various classes of organic contaminants (PAHs, PCBs, pesticides, pharmaceutical substances, endocrine disruptors, detergents,...) studying presence, fate and toxic impacts.



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16:30 – 18:00 – Pollution of aquatic systems (2) – EMERGENT ORGANIC POLLUTANTS: A SOCIOLOGICAL ANALYSIS

Geoffrey Carrère (*Irstrea, Bordeaux, France*)

With air pollution, the contamination of aquatic areas by the emergent organic pollutants, such as pesticides, PCB or drugs, appears as one of the important environmental challenges of our societies. But, paradoxically, if the contamination of water is invested by political, associations and economical actors, this risk still remains not very well known by a wide public. By taking the example of the contamination of aquatic areas by drugs, this sociological presentation will analyze this paradox by presenting the interplay of actors around this issue. We will see specifically some actions implemented in Sweden, Switzerland and France and we will highlight the social constraints experienced.



Short CV:

Geoffrey Carrère has a Phd in sociology obtained in an international joint tutoring between the Laval University and the University of Toulouse Capitole. His works deal with the risk issue analysed through the environmental sociology, the sociology of public policy and the sociology of sciences and expertise. Today, he specifically focuses his researches on the emerging risk issue in the domain of health-environment.

18:15 – 19:30 – GENERAL DISCUSSION

Thursday May 11

9:00 – 10:30 IMPACTS OF MINING ACTIVITIES ON OUR WATER RESOURCES: IS GREEN MINING AN ATTAINABLE OBJECTIVE OR AN INDUSTRIAL SMOKE SCREEN ?

Peter Campbell (*INRS University, Québec - Canada*)

The mining industry has a chequered history with respect to its environmental footprint. This presentation will deal with the life cycle of a typical mine (geochemical exploration; mine construction and operation; mine closure) and will consider the potential environmental impacts of mining activity on freshwater systems. Contrasting examples from research in northern Canada will be presented – both negative and positive – and considered in the context of Canada's Green Mining Initiative.



Short CV:

After completing his PhD in 1968 at Queen's University (Kingston, Ontario, Canada) in organometallic chemistry, Professor Campbell spent two years at Monash (Melbourne, Australia) working in the area of organo-phosphorus chemistry. In 1970 he returned to Canada and took up a position in a water research centre at the Institut national de la Recherche scientifique (Université du Québec, INRS-ETE), where he is currently an Emeritus Professor. He is interested in the biogeochemistry of metals in the aquatic environment.

Current research topics include elements of analytical chemistry (development and refinement of methods to determine metal speciation), geochemistry (identification of factors controlling metal speciation in natural waters) and ecotoxicology (development of predictive models relating the biological response elicited by a metal to its speciation, both in the external medium and in the intracellular environment). He directed the Metals in the Environment Research Network (MITE-RN) from 1998-2004 and he held a Canada Research Chair in Metal Ecotoxicology from 2002 until his retirement in 2015. He was elected to the Academy of Sciences of the Royal Society of Canada in 2002.



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11:00 – 12:30 – HOLISTIC TREATMENT AND MANAGEMENT OF EFFLUENTS – VALUE-ADDED APPROACH

Satinder Kaur Brar (INRS University, Québec - Canada)

Wastewater generated from municipal, industrial and agricultural activities has been increasing exponentially over the last decades driven by population increase. There has been a continual momentum towards advances in wastewater treatment stemming from innovation and strictly enforced regulations. Earlier, simple treatment and removal efficiency of the processes was the trend. Nowadays, there has been a shift towards value-extraction from these effluents mobilizing a new residual based bioeconomy. This talk will discuss the value-added approach of these effluents and as to how they have become the building blocks in the residual sourcing era.



Short CV:

Dr. S. K. Brar is Professor at Institut National de la Recherche Scientifique (Eau, Terre et Environnement, INRS-ETE) at Québec in Canada. She is leading the research group at the Bioprocessing and Nano-Enzyme Formulation Facility (BANEFF) at INRS-ETE. Her research interests lie in the development of formulations of wastewater and wastewater sludge based value-added bioproducts, such as enzymes, organic acids, platform chemicals, biocontrol agents, biopesticides, butanol and biohydrogen. She is also interested in the fate of endocrine disrupter compounds, pharmaceuticals, nanoparticles and other toxic organic compounds in wastewater treatment plants and their treatment technologies. She has collaborative programmes with several industries in Canada and researchers from Argentina, Spain, Chile, Switzerland, France, Vietnam, China, USA, India, Thailand, Sri Lanka, Mexico, Morocco, Tunisia and Ivory Coast. For more details, please see my webpage: [Webpage: http://www.ete.inrs.ca/satinder-kaur-brar](http://www.ete.inrs.ca/satinder-kaur-brar).

14:00 – 15:30 – SCIENCE-POLICY INTERFACE IN SUPPORT OF WATER POLICIES: HOW RESEARCH, DEVELOPMENT AND INNOVATION CAN HELP WATER MANAGERS IMPLEMENT THE EUROPEAN WATER FRAMEWORK DIRECTIVE (WFD)

Olivier Perceval (French Agency for Biodiversity, Paris, France)

Setting the scene: how is Europe dealing with water pollution? (e.g. substance-oriented regulation - REACH, source- and emission-oriented regulation - IED and Nitrates directive, and media-oriented regulations - WFD and MSFD). What are the current methods used for water bodies classification under the WFD (Environmental Quality Standards for priority/priority hazardous substances, and biological quality elements)? The challenges faced by member states of the EU in evaluating the quality of surface water bodies under the WFD have spurred on research and development in ecotoxicology and environmental chemistry to improve both chemical and ecological status assessment (e.g. organization of nationwide campaigns to identify emerging contaminants, development of passive sampler devices for the characterisation of chemical exposure, simplified tools to account for metal bioavailability – BLMs, innovative bio-analytical tools to monitor the quality of surface waters and effluents and account for mixtures, etc.).



Short CV:

Olivier PERCEVAL received his PhD in Biological Sciences from the University of Montreal (Canada) in 2004. In his research he explored the potential links between biomarker responses of aquatic organisms chronically exposed to metals and the manifestation of toxic effects at various levels of the biological organization (individual and population). He then joined the Group for Interuniversity Research in Limnology and Aquatic Environment (GRIL, Canada) as a postdoctoral fellow to develop eutrophication models for lakes. Shortly after moving to the UK to undertake an MSc programme in Environmental Policy and Regulation at the LSE, he was appointed in 2008 by the French National Agency for Water and Aquatic Environments (ONEMA), a state-owned agency active in the water sector assisting the Ministry of Environment in designing, implementing and evaluating environmental

policies. Since 2017, he works at the French Agency for Biodiversity as a scientific officer in ecotoxicology.



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**16:00 – 17:30 – GOVERNING WATER RESOURCES WITH ENVIRONMENTAL INDICATORS:
LOCAL, REGIONAL, AND GLOBAL ISSUES TOWARD SUSTAINABILITY**

Gabrielle Bouleau (*Irstrea, Bordeaux, France*)

Local co-production of ecological indicators by science and society (the emergence of ecological issues in water resources and the politics of green knowledge, path-dependency). Regional harmonization: experimentalist governance and policy learning in the *EU Water Framework Directive* (intercalibration and democratic challenges). Sustainable development vs ecological modernization (current global debates, critical questions for the future).



Short CV:

Gabrielle Bouleau was trained as an agronomist (MS in AgroParisTech) and an environmental engineer (Ingénieur du Génie Rural, des Eaux et des Forêts). She practiced three years as a state water engineer (1995-1998) designing water systems for rural communities. She came back to academia to teach comparative studies of water management and environment under the EU laws at ENGREF (1998-2005). In 2007, she defended a PhD in environmental sciences sociology and policy analysis at AgroParisTech, dealing with the implementation of the water framework directive in France. She documented the political, organisational and cognitive changes induced by this piece of law. Then she conducted a post-doctoral research in political ecology at UC Berkeley with Nancy Peluso and Matt Kondolf on river restoration in both contexts of the EU and the US. Her research at Irstrea is broadly situated in the field of political ecology and policy analysis. She addresses water management and environmental politics in the face of decentralisation, Europeanisation and globalisation.

18:00 – 19:30 – GENERAL DISCUSSION

**Friday May 12
The Venice Lagoon as a case-study**

**9:00 – 10:00 – INTEGRATED WATER DESIGN FOR URBAN SETTLEMENTS IN THE DRAINAGE
BASIN OF VENICE LAGOON**

Maria Chiara Tosi (*Università Iuav di Venezia, Italy*)

Integrated water design, the process which promotes the coordinated development and management of water, land and related resources, is fundamental for the sustainability of Venice and its mainland. The lecture will consider the Water system in the drainage basin of Venice lagoon, focusing on the relationships between water system and the decentralized urban landscape. Topics such as loss of landscape diversity and the increasing problems of flood, drought and water pollution in the drainage basin of Venice lagoon will be treated. Moreover, design measures based on decentralized water storage systems as well as multifunctionality - strategies and models which promote mutual benefits for both agriculture and urbanization will be introduced.



Short CV:

Maria Chiara Tosi (1965) is Associate Professor at the Department of Architecture and Arts of IUAV University of Venice, where she is also an active member of the faculty board of the PhD in Urbanism. Since 2016 she has been selected as member of the Research Foundation Flanders FWO expert panel W&T9: Science and Technology of Constructions and the Built Environment.



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Since 2015 she is Vice President of VEGA Venice Gateway for Science and Technology. She is broadly interested in how welfare state policies affect both the physical and the socio-economic aspects of urban environments. Specifically, her research is mainly –but not only- focused on the dispersion of settlements in the Veneto region. She has been part of numerous Italian and international research projects on the study of the evolution of urban settlements.

She has extensively lectured and published on public space, and on the building of scenario within fragile territories, in particular for Delta Landscape, affected by coastal erosion, subsidence, salinization and so on. Her recent books include: *Marzenego fiume metropolitano* (2016), *Welfare Spaces. On the Role of Welfare State Policies in the Construction of the Contemporary City* (2014), and *Toward an Atlas of European Delta Landscape* (2014).

She is in charge of the relationship among IUAV and various international institutions; she was Visiting Researcher at the College of Environmental Design at UC Berkeley.

She received a PhD in Urbanism from Sapienza, University of Rome, and a Master's in Urban Planning with honors from IUAV, University of Venice.

10:15 – 11:30 HISTORY OF VENICE FROM THE 5TH CENTURY

Luca Pes (Venice International University, Italy)

The History of Venice is the outcome of a constant interaction between water, land and humans, not only from the point of view of architectural forms, but also from the point of view of the economic, political and cultural developments of the city. The origins of the city, its development, its early environmental sustainability management, its Republican form and its merchant and military projection in the Eastern Mediterranean can be described in this light and in the context of a local political and cultural identity based on the idea of a commonwealth built on water. Such heritage explains certain features of the contemporary city debate on the Lagoon, which is so often based on the history of the Republican State.



Short CV:

Luca Pes, Professor of History of Venice at VIU - a course, which focuses on the interrelations between environmental setting, urban morphology, cultures, social relations and institutions in the Lagoon City from the origins to the present. Born in Venice. B.Sc. (Econ.) in History and Government (LSE, UK), Laurea in History (Ca' Foscari, Venice), Ph.D. in Italian Studies (Reading, UK). Vice Dean, Director of the School of Humanities and Social Sciences at VIU, where he taught every semester since the beginning of academic activities in 1997. He was Adjunct Associate Professor of European Studies at Duke University and Professor of Modern and Contemporary History at the Faculty of Philosophy of San Raffaele University in Milan. Taught Urban and Contemporary History at the Faculty of Regional Planning of IUAV and Contemporary History at Ca' Foscari. Published and publishes mostly on Venetian 19th-21st Century Cultural and Social History, and on the Methodology of Local and Urban History. Research and teaching interests include Cinema and History, and Contemporary Italian Society. Currently working on *Urban Unrest in Modern Venice*. He contributed or collaborated with academic reviews such as "History and Memory" (Indiana University Press), "European Contemporary History" (Cambridge University Press) and "Mediterranean Historical Review" (Routledge Publishers).

11:30 – 12:30 – ECOLOGICAL CHARACTERISTICS OF THE VENICE LAGOON

Roberto Pastrers (Ca' Foscari Univ, Italy)

The functioning of the Venice Lagoon "Ecosystem" as a whole is, in fact, the result of a complex set of interactions among the biotic and abiotic components characterizing its different habitats.

This lecture will provide an overview of: 1) the main physical, biogeochemical and ecological processes, driving its dynamics; 2) the recent evolution of its status, in relation to the main anthropogenic pressures.



Short CV:

Roberto Pastrers, born in Venice on May 15th 1962, Ph.D, is associate professor of Ecology at the Department of Environmental Sciences, Informatic and Statistics of the University of Venice Ca' Foscari (Italy).



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Since 1987, his research activity has mainly concerned the development of mathematical models for the simulation of biogeochemical and ecological processes in coastal and marine ecosystems, with a special focus on their application to the sustainable management of finfish and shellfish marine aquaculture. He also has a large experience in time series analysis of biogeochemical and ecological data concerning marine ecosystems, data assimilation, data fusion and design of monitoring networks. He has coauthored more than 50 papers on peer review international journals. He has participated to several EU projects and coordinated the FP7 project MEDINA (Marine Ecosystem Dynamics and Indicators for North Africa). In 2014 he set up the SME "Bluefarm", as a spin-off company of Ca' Foscari University.

14:00 – 15:30 – HYDRODYNAMICS AND SEDIMENT TRANSPORT

Georg Umgiesser (National Research Council of Italy - ISMAR, Venice, Italy)

The Venice Lagoon is mainly shaped by its hydrodynamic characteristics. The inlets regulate the water exchange with the open sea and rivers are bringing fresh water to the lagoon. Moreover, sediments are exchanged with the sea, are imported through the rivers, and are reworked inside the lagoon. All of these processes have contributed in the last thousands of years to form the lagoon. However, mankind has heavily impacted this natural equilibrium, creating the lagoon as we know it nowadays. New channels have been dredged, inlets have been fortified, and mobile barriers are under construction. Only future will tell us what this means for the Venice Lagoon.



Short CV:

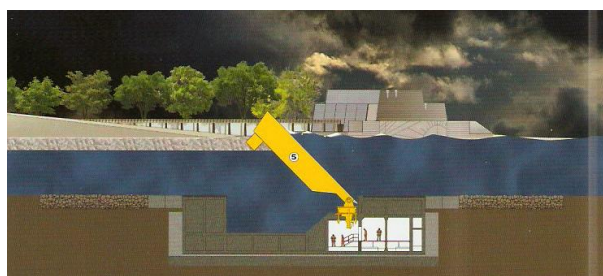
Georg Umgiesser has two master degrees in oceanography and physics and a PhD in biomedical sciences. He is working at the CNR as a senior scientist. Principal fields of investigation are hydrodynamic modeling, circulation and sediment transport. He has developed a series of finite element models for shallow water bodies (SHYFEM) for the study of hydrodynamic processes, water quality and transport phenomena. He has participated in various EU projects dealing with the North Sea and the Mediterranean, turbulence studies and application of 3D models. He was a visiting professor at the Kyushu University, Japan. He is also lead researcher at the Open Access Center of Klaipeda University. He is the Italian coordinator of the ESFRI project Danubius-RI dealing with studies on river-sea systems.

15:30 – 18:30 – SITE VISIT TO THE PUNTO MOSE

The visit to the PUNTO MOSE will focus on the works of the system under construction to protect Venice from high water, the monitoring and control room.



Film projection: "MOSE, the mobile barriers for the defence from floods"



19:30 – 22:30 – SOCIAL DINNER

Saturday May 13



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9:00 – 13:00 – THE VENICE LAGOON: VISIT TO SALT MARSHES

Sonia Silvestri

The Venice lagoon will be explored in order to understand better the natural and artificial features characterizing water management issues. In particular, the visit will focus on natural and artificial salt marshes.



Sonia Silvestri (Duke University, USA)

Coastal areas, lagoons and estuaries are extremely complex systems, characterized by continuous evolution of morphological features and water quality changes. A continuous and reliable set of observations is essential to monitor the evolution of these systems, and plan effective management strategies. In this seminar, Silvestri will present how satellite and airborne sensors, combined with observations performed in the field, are applied for a comprehensive monitoring of the state of coastal systems. Applications to the Venice lagoon will be discussed.



Short CV:

Adjunct Assistant Professor (Division of Earth & Ocean Sciences, Nicholas School of the Environment, Duke University). Sonia Silvestri received her doctoral training in Environmental System Modelling at the University of Padova, with a focus on remote sensing and the interdependence of salt marsh morphology and halophytic vegetation. She received her Laurea in Environmental Sciences from the University Ca' Foscari in Venice. Silvestri joined the Nicholas School (Duke University) in 2011.

Moreover, Sonia Silvestri is the director of a Duke summer program at the Venice International University "Environmental Management in a Changing World: coping with Sea Level Rise". Her research focuses on: - Remote Sensing applied to vegetation mapping, soil studies, hydrology, tidal environments morphology – Remote sensing of coastal water quality - Hyperspectral imagery analysis - Salt marsh evolution modelling – Remote sensing of coastal dune vegetation – Peatland detection through remote sensing – Peat degradation - Relationship between wetlands morphology and vegetation - Mosquitoes population dynamic. The Venice lagoon and its watershed have been her principal research sites in the last 15 years. In particular, she is expert in the use of satellite remote sensing for the lagoon water quality (turbidity, phytoplankton, water temperature, etc.), the study of the submerged vegetation dynamic and the study the halophytic vegetation and its interaction with the morphology.