CURRICULUM VITAE – BARBARA ZANUTTIGH (BZ)

PERSONAL DATA

BIRTH PLACE AND DATE	Bologna, 09/18/1975
NATIONALITY	Italian
OFFICE CONTACTS	University of Bologna Department of Civil, Chemical, Environmental and Materials Engineering (DICAM) - Viale Risorgimento, 2 – 40136 Bologna Phone: +390512093754
OTHER CONTACTS	Mail: barbara.zanuttigh@unibo.it Skype: barbara.zanuttigh Website: http://www.unibo.it/sitoweb/barbara.zanuttigh

PRESENT POSITION

2014-present	Associate Professor of Hydraulics at the University of Bologna.

PREVIOUS APPOINTMENTS

2019-2015	Visiting Scholar of Coastal structures at Delft University of Technology.
2015-2014	Visiting Professor of Coastal structures at Delft University of Technology. Sharing of the research and teaching activities between the University of Bologna (60%) and Delft University of Technology (40%).
2014-2006	Assistant Professor in Hydraulics at the University of Bologna.
2006-2002	Research Fellow at the Hydraulic Institute of the Faculty of Engineering of the University of Bologna.
2006-2003	Teaching assistant of the course of Advanced Hydraulics for Environmental Engineers at the Faculty of Engineering of the University of Bologna.
2006-2002	Teaching assistant of the course of Fluid Mechanics for Mechanical Engineers at the Faculty of Engineering of the University of Bologna.

EDUCATION

2002-1998	PhD in Hydraulic Engineering, Polytechnic of Milan, Mark: Excellent.
1998	Professional qualification to Engineering Practice, Mark: 100/120.
1998-1993	Degree *cum laude* in Mechanical Engineering at the Faculty of Engineering at the University of Bologna.
1993-1988	High School, Classical liceo 'Marco Minghetti', Bologna, Mark: 60/60.

LANGUAGE SKILLS

Italian	Mother tongue
English	Fluent oral and written language

SOFTWARE AND PROGRAMMING SKILLS

- Use of Windows and Dos operating systems, Microsoft Office;
- Use of the MIKE21 modelling suite (SW, PMS, HD, ST-Q3, BW, MT, EcoLab) by DHI;
- Use of AQWA modelling tool by ANSYS;
- Programming in Fortran, C and Matlab.

RESEARCH

Publications

BZ is author of more than 150 publications in international refereed journals and conference proceedings, achieving an **h-index** equal to **30** and more than 2300 citations (source: Scopus). A detailed list of publications is reported in the specific section of this CV.

Topics

At present, the main research interests of BZ focus on Coastal and Ocean Engineering and specifically: wave interaction with coastal structures and coastal flood risk, wave energy and multi-use off-shore platforms. Within Coastal Engineering, BZ has already gained more than 15-year-experience. The scientific research of BZ shows a high degree of eclecticism covering:

- coastal flooding and erosion risk, with the support of numerical and conceptual models;
- wave-structure interaction, with the development of new formulae, neural networks, conceptual models, physical models in wave tanks and numerical 2DV and 3D RANS-VOF codes;
- wave energy converters: mooring design and assessment of energy production;
- multi-use off-shore platforms: criteria for conceptual design and potential of the re-use of O&G platforms instead of decommissioning;
- analysis and development of cost-efficient and eco-compatible interventions for beach defence planning, through interdisciplinary works;
- hydro-morphodynamics around low crested breakwaters through experimental, prototype and numerical (i.e. 2DH codes) investigation;
- fee-surface flows, with focus on roll-waves, debris surges and dam-breaks, through the development of a specific 1D numerical code and innovative experiments. This topic was mainly limited to the PhD activity.

Research projects

2022-2019 National Responsible of the COST Action CA17105, **A pan-European Network for Marine Renewable Energy** (WECANet)

2021-2018 Scientific responsible for the University of Bologna of the National Industrial **PLACE** Project (PON-FESR) **“Conversion of off-shore platforms for multiple eco-sustainable uses”**, co-funded by the Italian Ministry of the University and the Research (125'000€). In this project BZ is leader of the OR 4 "Development, installation and operation of systems for wave energy harvesting integrated in off-shore platforms".

2020-2016 Scientific responsible for the University of Bologna within the H2020 Programme **BRIGAID** project "**Bridging the Gap for Innovations in Disaster Resilience**" (750'000 €). The ambition of BRIGAID is to provide structural and ongoing support for innovations in climate adaptation by developing an innovative mix of assessment methods and tools which should become the new standards.

2015-2012 Scientific responsible for the University of Bologna of the project **MERMAID**, **"Innovative multi-purpose off-shore platforms: planning, design and operation",** Grant n.288710 (320'000€), Collaborative Integrated Project funded by the EC within the call FP7.OCEAN2011-1, Jan 2012-Dec 2015. In this project BZ is leader of the WP "Innovative platform plan and design" and of the WT "Energy converters".

2014 - 2010 Scientific responsible for the University of Bologna of the **SDWED** project **"Structural Design of wave energy devices"**, funded by the Danish Agency for Science Technology and Innovation (130'000€), Jan 2010–Dec 2014. Project website: www.sdwed.civil.aau.dk. In this project BZ is leader of the WP "Moorings".

2013-2009 Coordinator of **THESEUS** project, **"Innovative technologies for safer European coasts**

in a changing climate", Grant n.244104 (6'530'000 €), Large Collaborative Integrated Project funded by the EC within the call FP7.ENV2009-1, 31 partners from 18 countries, Dec 2009 - Nov 2013, 48 months. Project website: www.theseusproject.eu
In this project BZ, besides being the Coordinator, is the Scientific Responsible for the University of Bologna (914'000 €) and leader of the WP "Risk mitigation options and tools for defence planning strategies in study sites".

Since 2012 Scientific responsible of Research Unit for the University of Bologna within the National Programme **RITMARE "Italian Research on the Sea), WP "Modelling of off-shore and coastal infrastructures"** (50'000 €), Jan 2012 – Dec 2016. Project website: www.ritmare.it/en/.
The research activity is "Wave energy and coastal and harbour protection. Modelling the hydrodynamics induced by off-shore floating wave energy arrays and by innovative harbour breakwaters".

2012 Scientific responsible for the University of Bologna of the project **REDEM "Reliable design of mooring systems of wave energy converters"**. Effects on device hydrodynamics and power performance" funded by the FP7 open call MARINET (5'000€) for the access to the wave basin in Aalborg.

2009-1999 Participant in the Research Units of the University of Bologna

EU contracts:

- ENCORA "European Platform for Coastal Research Coordination Action" Coordinated Action, 2006-2009;
- BEACHMED-E "Strategic management of beach protection for sustainable development of Mediterranean coastal zones", through a contract with Regione Emilia-Romagna, www.beachmed.it, Interreg III-C, 2005-2008;
- CoastView "Developing coastal video monitoring systems in support of coastal zone management", contract EVK3-CT2001-00054, 2002-2005;
- DELOS "Environmental Design of Low Crested Coastal Defence Structures", EVK3-CT2000-00041, 2001-2004, www.delos.unibo.it;
- THARMIT "Torrent Hazard Mitigation and Risk Assessment", EVG1-CT-1999-00012, 1999-2002;
- "Debris Flow Risk", ENV4-CT96-0253, 1996-1999;

National contracts:

- PRIN 2005 "Off-shore dredging and nourishment: morphological modelling and applications", 2005-2007;
- PRIN 2005 "Modern technologies for costs reduction in the harbour defence structures", 2005-2007;
- PRIN 2003 "Integrated analysis of selected cases of debris flows in the alpine arc", 2003-2005;
- PRIN 2001 "Hydrodynamics and morphodynamics of beach protected by low-crested structures", 2001-2003;
- MURST "Fluvial and Coastal Morphodynamics", 1998-2000.

Research Innovation

Wave overtopping. BZ research activity on wave overtopping has led to international recognition, by the inclusion in the **EurOtop research team**, an internationally recognized team of experts who delivered a new version of the wave overtopping manual for consultants, researchers and practitioners through the website www.overtopping-manual.com. BZ with her research group developed a new database and a new Artificial Neural Network (ANN) tool for the prediction of the wave overtopping discharge, the wave reflection and transmission coefficients at a variety of coastal

and harbor structures. The ANN tool is freely disseminated on a dedicated website (www.unibo.it/overtopping-neuralnetwork/), with more than 600 registered users nowadays.

Multi-use Off-shore platforms. In the framework of sustainable marine use planning and blue growth, BZ developed an innovative multi-criteria procedure for the selection of different economic activities to be co-located at a given marine area and a conceptual interdisciplinary design application of multi-use in the Mediterranean. Following this experience gained in the FP7 **MERMAID project** and based on the principle of circular economy, BZ is promoting in the **PLACE** National Industrial **project** the idea of re-using instead of decommissioning O&G platforms, to support the increasing demand for energy and food while reducing the environmental impacts and the cost due to sharing existing off-shore infra-structure and logistics.

Coastal Risk Assessment and Mitigation. BZ prepared and promoted as Coordinator the proposal of a fully interdisciplinary research aimed at **coastal risk assessment and sustainable mitigation**: the FP7 **THESEUS project**. The THESEUS project is the largest Integrated Project so far funded by the European Commission for safer coastal areas. It developed a holistic framework for risk assessment including climate change and proposed a portfolio of mitigation options, including innovative coastal structures, habitat creation and reinforcement, measures for promoting social and economic resilience, and finally supported the implementation of policies and the take up from the industry. It attracted interest from a large audience: Euronews channel, local and national press (see the media section in the publication list); thematic sessions at international conferences (see the Conference organization section); invitations to policy-oriented events, to fairs and to prepare Web-seminars (see the invited talks and contributions in the publication list). A journal paper to illustrate the approach was published in 2011 in a Special Issue of Environmental Science and Policy, Elsevier, promoted by the European Commission. BZ was Guest Editor of the Special Issue "Coasts@Risks: THESEUS, a new wave in coastal protection", published in 2014 on Coastal Engineering, Elsevier, and first editor of the monographic book published by Elsevier "Coastal risk management in a changing climate". Among the innovative mitigation options proposed by BZ in THESEUS project, there is the investigation of the possibility to combine **coastal protection and wave energy production**, which recalled the attention of the scientific community both at international and national scale (invited talks and seminars).

Low crested breakwaters. BZ developed or participated to the development of new formulae for **wave reflection and wave transmission** at coastal and harbour structures. BZ was involved in the EC funded project DELOS, where showed her particular skills in coastal engineering and ability towards working within international teams. She is author of many cited papers about **hydro-morpho-dynamics around low crested breakwaters**, many of which were written in cooperation with different institutions all over Europe. Among the published papers, the research on wave interaction with low crested breakwaters generated high impact in the research community. She promoted a **multidisciplinary methodology for sustainable coastal defence design** and selection. Thanks to the recognized scientific expertise on this topic BZ is one of the editors of the monograph edited by Elsevier in 2007 and co-author of an invited contribution to the Handbook of Coastal Engineering edited by World Scientific in 2009.

Debris Flows. Based on field data and numerical modelling, BZ developed a theory for predicting **instability development in debris flows**, an issue that is particularly relevant for a correct sizing of mitigation measures due to the increased peak thrust in connection to multiple surge events. A contribution on this topic was invited on Reviews of Geophysics in 2007 and is the synthesis of most of the PhD activities.

Roll waves. BZ proposed in 2002 a new unsteady flow approach for **modelling roll waves**, using a fully non-linear, shock-capturing model she implemented during the PhD. The method allowed to

predict wave characteristics and improve criteria for minimum channel length required for roll-wave development.

Visiting research overseas

2014 Visiting Scholar of Coastal structures at Delft University of Technology within the Hydraulic Structures and Flood Risk division. March-Sept. 2014. Cooperation with Prof. S. N. Jonkman. Prof. M. Stive, Prof. W.Uijttewaal .

2012 Visiting researcher at Aalborg University, Aalborg, Denmark. Funded by REDEM project through the FP 7 MARINET access. Experiments in the shallow water wave basin on mooring systems of wave energy converters. Cooperation with Prof. J. P. Kofoed. Oct-Nov 2012.

2009 Visiting researcher at Aalborg University, Aalborg, Denmark. Funded by the International SDWED project. Experiments in the deep water wave basin on hydrodynamics and power production of a wave activated energy converter. Cooperation with Prof. J. P. Kofoed. Jan - Nov 2009.

2008 Visiting researcher at the University of Cantabria, Santander, Spain. Funded by the FP6 ENCORA Coordinated Action. Joint numerical modelling activities with the IH2-VOF code by Cantabria. Cooperation with Prof. J. L. Lara. Jul 2008.

2006, 2006, 2003 Visiting researcher at Infram l.t.d, Marknesse, the Netherlands. Funded by the FP 5 DELOS project. Analysis of data on wave interaction with coastal and harbour structures, with focus respectively in the three periods on a new formula for wave reflection, on the analysis of spectral changes and on wave transmission at low crested breakwaters. Cooperation with Dr. J. W. van der Meer. Aug 2006, 2005 and 2003.

2004 Visiting researcher at DHI Water & Environment, Hoersholm, Denmark, funded by the FP 5 project DELOS. Modelling activities on long term morpho-dynamic simulations of sea bed evolution around low crested structures and comparison with prototype data. Cooperation with Dr. J. A. Zyserman. Mar 2004.

2002 Visiting researcher at Aalborg University, Aalborg, Denmark. Funded by the FP 5 DELOS project. Experiments in the shallow water wave basin on the hydrodynamics induced by low crested breakwaters. Cooperation with Prof. H. F. Burcharth. Jul - Aug 2002.

2001 Visiting researcher at CEMAGREF, Grenoble, funded by the GALILEO exchange project between Italy and France. Experiments and numerical modelling of dam breaks in non-newtonian flows. Cooperation with Dr. D. Laigle. Jul- Aug 2001.

2000 Manchester Metropolitan University, Manchester, July 2000, UK– financed by the THARMIT project.

EDITORIAL ACTIVITY

Since 2021 Member of the Editorial Board of the Civil Engineering section of *Scientific Reports*, published by Nature

Since 2021 Editor-in-Chief of *Coastal and Off-shore Journal*, Frontiers in Built Environment, https://www.frontiersin.org/journals/built-environment/sections/coastal-and-offshore-engineering

Since 2018 Member of the Editorial Board of the *Journal of Marine Science and Engineering* (JMSE; ISSN 2077-1312, www.mdpi.com/journal/jmse/), Section Ocean Engineering.

Since 2015	Member of the Editorial Board of *Renewable and Sustainable Energy Reviews*, Marine and Wind Energy, Elsevier, www.journals.elsevier.com/renewable-and-sustainable-energy-reviews/
Since 2014	Review Editor for "Ocean Engineering, Technology, and Solutions for the Blue Economy" (www.frontiersin.org)
2014	Editor of the Special Issue "Coasts@risks: THESEUS, a new wave in coastal protection", composed by 18 papers published in Coastal Engineering, 87, 248 pp., Elsevier, http://www.sciencedirect.com/science/journal/03783839/87.
2014	First Editor of the book authored by THESEUS project team: "Coastal risk management in a changing climate", Zanuttigh B., Nicholls R., Vanderlinden J. P. editors, Elsevier, 671 pp., ISBN: 978-0-12-397310-8, http://store.elsevier.com/Coastal-Risk-Management-in-a-Changing-Climate/isbn-9780123973108/
Since 2012	Member of the Editorial Board of the Coastal Wiki, www.coastalwiki.org/coastalwiki/Main_Page.
2007	Co-editor of the book "Environmental Design Guidelines for Low Crested Coastal Structures", Elsevier, 448 pp., ISBN: 978-0-08-044951-7, Burcharth, H. F, Hawkins, S. J., Zanuttigh, B., Lamberti, A. editors, http://store.elsevier.com/product.jsp?isbn=9780080555829&pagename=search

REVIEWER ACTIVITY

Elsevier	Coastal Engineering; Ocean Engineering; Renewable Energy; International Journal of Marine Energy; Applied Ocean Research; Journal of Hydrology; Environmental modelling and software; Science of the Total Environment, Renewable and Sustainable Energy Reviews
Cambridge University Press	Journal of Fluid Mechanics
American Society of Civil Engineers	Journal of Waterways, Port, Coastal and Ocean Engineering; Journal of Hydraulic Engineering
World Scientific	Coastal Engineering Journal
American Geophysical Union	Natural Hazards and Earth System Sciences
Taylor & Francis Group	Journal of Hydraulic Research

PRIZES AND AWARDS

Prizes

2019	Horizon Impact Award, awarded by the European Commission. This prize is dedicated to EU-funded projects that have created societal impact across Europe and beyond. The SMART-COASTS proposal, coordinated by BZ, demonstrated the social impact of the FP7 project THESEUS: no innovation can be a standing-alone solution, but adaptation to climate change can be achieved through a combination of people-centered solutions that preserve the environment.
2008	National Prize "Evangelista Torricelli", given by the Italian Hydraulics Group (http://www.gii-idraulica.net/) for the "important contributions to fluid mechanics applied to hydraulics". The prize is assigned every two years since 2006 to the best young researcher (less than 33 years) in hydraulics.

Invited papers and talks

Invited refereed papers: n. 31 and n. 47 in the full Publication list, under International Refereed Journals with Impact Factor.

Invited talks and non-refereed contributions: 15 contributions see the specific point in the Publication list.

Board Member, Co-venor and Chair at International Conferences

2021, 2020	EC Expert evaluator in Panel Reviews of H2020 projects
2020	Invited chair at the conference: «International Conference on Coastal Engineering (ICCE) », September 2020, online
2019	Member of the Scientific Committee of the "Coastal Structures and Solutions to Coastal Disasters Joint Conference 2019", Hamburg, Germany, September 2019.
2018	Invited chair at the conference: «International Conference on Coastal Engineering (ICCE) », August 2018, Baltimore, USA.
2015	Member of the Scientific Committee of the "Coastal Structures and Solutions to Coastal Disasters Joint Conference 2015", Boston, Massachusetts, September 2015.
2013	Co-organiser of the «THESEUS Science and Policy Interface conference», Brussels, October 2013.
2013	Invited chair at the conference: «European Wave and Tidal Energy Conference (EWTEC), Aaalborg, September 2013.
2013	Member of the Scientific Committee of the «International Conference on Flood Resilience. Experiences in Asia and Europe», Exeter, September 2013.
2012	Invited chair at the conference: «International Conference on Coastal Engineering (ICCE) », July 2012, Santander, Spain.
2011	Co-chair of the Session «Coastal risks in a changing climate». Coastal Structures Conference 2011, Yokohama, Japan, September 2011.
2011	Co-venor of the session «Coastal flooding and erosion risk: present and future». European Geophysical Assembly (EGU), Wien, Austria, April 2011.
2010	Co-venor of the session «Coastal flooding and erosion risk: present and future». European Geophysical Assembly (EGU), Wien, Austria, April 2010.
2010	Invited chair at the conference: «International Conference on Coastal Engineering (ICCE), July 2010, Shangai, China.

Press and multimedia

2019	SMART-COASTS, project winner of the Horizon Impact Award. https://www.youtube.com/watch?v=hY8pB8PSg8Y
2019	Università di Bologna Magazine: "Horizon Impact Award 2019: premiata la proposta SMART-COASTS, guidata dall'Università di Bologna", in Italian. https://magazine.unibo.it/archivio/2019/09/27/horizon-impact-award-2019-premiata-la-proposta-smart-coasts-guidata-dall2019universita-di-bologna
2010	Euronews, A new wave in coastal protection. http://www.euronews.net/2010/07/28/a-new-wave-in-coastal-protection/
2010	La Repubblica. Ilaria Venturi: "The beach of Cesenatico and the archaeological ruins in Syria are saved by the funds from Brussels", in Italian. http://ricerca.repubblica.it/repubblica/archivio/repubblica/2010/11/03/mare-di-

cesenatico-rovine-in-siria-si.html

2010 Publico. Marta del Amo: “Europe fights sea level rise”, in Spanish http://www.publico.es/ciencias/306315/europa-lucha-contra-la-subida-de-las-aguas

2010 Terra Noticias. “Martin meets the researchers of THESEUS projects on climate change”, in Spanish http://noticias.terra.es/2010/local/0428/actualidad/martin-se-reune-con-los-investigadores-del-proyecto-europeo-theseus-sobre-cambio-climatico.aspx

2010 PensaLibero. Fabrizio Binacchi: “Easy to say: researcher”, in Italian. http://www.pensalibero.it/Dettaglio.asp?IDNotizia=5571

2010 ASTER, the night dedicated to Research at the University of Bologna. Fabrizio Binacchi: “How to build up and manage a huge but efficient partnerships in FP7 RTD projects”, in Italian. http://first.aster.it/news/show_news.php?ID=22859

2010 Università di Bologna Magazine. Monica Lacoppola: “Theseus: 6,5 M€ to study the European coasts”, in Italian. http://www.magazine.unibo.it/Magazine/UniBoIniziative/2010/10/21/Theseus.htm

2009 Il Sole 24 Ore. Francesca Barbieri, “Complicated bureaucracy experiments”, in Italian. http://www.ilsole24ore.com/art/SoleOnLine4/dossier/Italia/2009/commenti-sole-24-ore/10-maggio-2010/esperimenti-complicati-burocrazia.shtml?uuid=62d1c6bc-5bfc-11df-b160-dce348480905&DocRulesView=Libero.

MEMBERSHIPS: ACADEMIC BOARDS, COMMITTEES AND PROFESSIONAL AFFILIATIONS

Since 2017 Member of the GTA Climate, Resource Efficiency & Raw Materials. GTA are Topic Research Group of the University of Bologna realised by the Rector to promote the involvement in European research projects.

Since 2015 Responsible for the University of Bologna of the OCEAN ENERGY Joint Programme within European Energy Research Alliance (EERA, http://www.eera-set.eu/), by appointment of the Vice-Rector for Research only.

Since 2014 Responsible for the University of Bologna (affiliated partner) of the Climate-KIC (http://www.climate-kic.org/), by appointment of the Vice-Rector for Research only.

Since 2014 Board Member of “PhD@DICAM”, University of Bologna.

2014 Member of the Assessment Committee for Associate Professor in Wave Energy Utilization, Aalborg University.

Since 2013 Board Member of the SHERPA-EU team and responsible for CLIMATE ACTION, by appointment of the Vice-Rector only. This consulting group chaired by the Vice-Rector for Research at the University of Bologna develops conceptual papers and proposals for promoting strategies and actions within the European Commission funding initiatives and programmes.

Since 2013 Board Member of the PhD in Civil, Chemical, Environmental and Materials Engineering, University of Bologna.

Since 2013 Board Member of the School in Civil Engineering and Architecture, University of Bologna.

2015-2011 Board Member of the PhD in Civil, Chemical, Environmental and Materials Engineering, University of Bologna.

2013 Expert Member of the Interdisciplinary Assessment Committee of the Research Projects to be funded by the University of Bologna. Membership by appointment of

	the Rector only.
2013	Expert Member of the Assessment Committee of the PhD in Civil and Environmental Engineering Science, University of Padova.
2013	Member of the Assessment Committee for Associate Professor in Wave Energy, Aalborg University.
2009	Member of the Assessment Committee for Associate Professor in Coastal Engineering, Aalborg University.
2009-2008	Board Member of the PhD in Structural and Environmental Engineering, University of Bologna.
2008	Member of the Assessment Committee for Associate Professor in Wave Energy, Aalborg University.
Since 2006	Member of the Teaching Boards of Civil Engineering and Environmental Engineering, University of Bologna.
Since 1999	Member of the Association of the Engineers in Bologna, subscription n. 5695.

CONSULTANCY ACTIVITY

2011	Analysis of the existing technologies for the assessment and exploitation of the marine energy resources in the Italian seas. Requested by ENEA Research Institute, Italy.
2010	Analysis of the flooding of littoral and urban areas at Lido di Savio and Cesenatico. Requested by Gecosistema consultancy agency for the Geologic and Seismic Division of the Regione Emilia Romagna, Italy.
2010	Hydro-morphological effects of the hypothetical pontoon in design phase in Riccione. Requested by the municipality of Riccione, Italy.
2009	Hydro-morphological analysis of the Cesenatico beach and proposal of executive designs. Requested by ARPA, the Regional Agency for the Protection of the Environment, Emilia Romagna, Italy.
2008	Hdyrodynamic analysis for the design of the marina of Casal Borsetti. Requested by PORTO RENO srl.
2007 – 2005	Hydro-morphological monitoring of Igea Marina beach. Requested by ARPA, the Regional Agency for the Protection of the Environment, Emilia Romagna, Italy.
2005 – 2004	Hydro-morphodynamic modelling of the littoral evolution adjacent to Cervia harbour. Requested by ARPA, the Regional Agency for the Protection of the Environment, Emilia Romagna, Italy.
2003	Monitoring and renaturalisation protocol of the “Piallassa Baiona”. Requested by the municipality of Ravenna.
2003	Modelling of the wave disturbance in La Spezia harbour and analysis of the dynamic actions against the new structures in the marina under construction for Ferretti’s boat marina. Requested by ACMAR spa, Ravenna, Italy.
2002- 2001	Proposal of design changes to the recirculation pumping systems in the Marina di Ravenna harbour. Requested by the Ravenna municipality, Italy.
2002- 2001	Three-years monitoring and analysis of the coastal structures protecting the beach nourishment in Lido di Dante, Ravenna. Requested by AGIP, Italy.
1999- 1998	Executive design of the hydraulic maintenance and environmental renaturalisation of the River Tenna basin. Requested by the Marche Regional Government, Italy.

TEACHING AND SUPERVISION

Teaching assignments

Since 2016 — In charge of Module II of the course of *Coastal Engineering* (2 ECTS, 24 hours teaching in the period 2016-2019; 4 ECTS, 48 hours teaching since 2020), in English, for Civil Engineers at the University of Bologna, International Master course.

Since 2016 — In charge of the course of *Hydraulics* (9 ECTS, 90 hours teaching), in Italian, for Environmental Engineers at the University of Bologna, Bachelor course.

Since 2006 — In charge of the course of *Maritime Hydraulics* (6 ECTS, 60 hours teaching – 48 hours teaching starting from 2014), in Italian, for Civil and Environmental Engineers at the University of Bologna, Master course.

2016 - 2014 — In charge of the Modules II (unsteady flows, open channel flows) of the courses:

i) *Hydraulics* (5 ECTS, 50 hours teaching) for Civil Engineers
ii) *Hydraulics and Urban Hydraulics Constructions* (3 ECTS, 30 hours teaching) for Building Engineers & Architects

at the University of Bologna, Bachelor courses, in Italian.

2013-2011 — In charge of the Module II (open channel flows) of the course of *Hydraulics* (3 ECTS, 30 hours teaching), in italian, for Civil Engineers at the University of Bologna, Bachelor course.

2009 – 2006 — In charge of the course of *Advanced Hydraulics* (6 ECTS, 60 hours teaching), in Italian, for Environmental Engineers at the University of Bologna, Bachelor and Master courses.

2006 - 2003 — Teaching assistant of the course of *Advanced Hydraulics*, in Italian, for Environmental Engineers at the University of Bologna, Bachelor and Master course.

2005 - 1999 — Teaching assistant of the course of *Fluid Mechanics*, in Italian, for Mechanical Engineers at the University of Bologna, Bachelor course.

2002- 2001 — Teaching assistant at the University of Bologna of the courses of: *Hydraulics and Hydraulic urban works*, in Italian, for Building Engineers and Architect, Bachelor course; *Advanced Hydraulics*, in Italian, for Environmental Engineers, Bachelor and Master courses; *Hydraulics*, in Italian, for Civil Engineers, Bachelor course.

Supervision of PhD students and Research Fellows

Since 2011 — Tutor of **7** PhD students within the PhD in Civil and Environmental Engineering

- Elisa Dalla Valle, Modelling innovative wave energy devices integrated in multi-use marine areas, 2019-ongoing.
- Giuseppina Palma, Numerical modelling and structural optimization of multifunctional maritime structures aimed to protect harbours and produce energy, 2016-2019.
- Silvia Unguendoli, Development of an ensamble modelling chain for hydraulic vulnerability assessment under uncertainties, 2015-2018.
- Sara Mizar Formentin, Analysis and modelling of the vulnerability and resilience of coastal structures, 2012-2015.
- Stefano Bagli, A web GIS decision support system for coastal risk assessment and mitigation planning, 2011-2015.
- Elisa Angelelli, Hydrodynamics induced by an array of wave energy converters. Experimental and numerical analysis, 2011-2014.
- Andrea Natalia Raosa, Analysis and mathematical modelling of wave-structure interaction, 2011-2014.

Since 2010 Supervisor of **8** Research Fellows funded on personal research funds

- Elisa Dalla Valle, Numerical modelling of mooring systems for floating wave energy devices, 48 months research fellowship since February 2019, funded by the PON-FESR project "PLACE";
- Giuseppina Palma: "Numerical modelling and structural design of harbour structures for renewable energy production", 48 months research fellowship since August 2015, funded by PLACE, BRIGAID and THESEUS project;
- Sara Mizar Formentin: "Modelling wave-structure interaction within multi-purpose design of coastal defences", 72 months research fellowship since April 2012, funded by BRIGAID, RITMARE and THESEUS projects;
- Elisa Angelelli: "Wave energy conversion and coastal protection", 42 months research fellowship since October 2011, funded by MERMAID and THESEUS projects;
- Caterina Zoppi: "Ecologically based techniques for nourishment interventions", 12 months research fellowship, October 2011-September 2012, funded by THESEUS project;
- Giovanna Bevilacqua: "Design of mooring systems for wave energy converters", 14 months research fellowship, September 2011-December 2012, funded by SDWED project;
- Andrea Natalia Raosa: "Analysis and two-phase modelling of littoral hydro-morphodynamics", 47 months research fellowship, July 2010-May 2014, funded by THESEUS project;
- Mirko Castagnetti: "Test and design of technologies for wave energy conversion", 12 months research fellowship, June 2010-May 2011, funded by SDWED project.

Supervision of MsC and BsC students

Since 2007 Supervisor of > **90** degree theses in *Coastal Engineering* and *Advanced Hydraulics* and of > **30** master theses in *Advanced Hydraulics* and *Hydraulics*.

Among these degree theses

- 14 were performed within Erasmus exchanges promoted in cooperation with the University of Aalborg (14), Denmark, and with the University of Cantabria (2), Spain. These theses were essentially dedicated to joint experimental activities on renewable energy from the sea;
- 8 theses were carried out within the Erasmus exchange with the University of Ghent, of which BZ is responsible; these theses dealt with wave energy and with new experimental and numerical modelling of wave overtopping;
- 2 theses were performed in cooperation with the University of Delft, about wave overtopping and application to desalinization of marine turbines;
- 1 thesis was performed in cooperation with the University of Delaware, USA, about flooding vulnerability;
- 1 thesis was performed in cooperation with the Technical University of Lisbon, Portugal, about a harbor breakwater extension in Leixoes;
- 3 theses were carried out with the University of Pavia, Italy, within a joint experimental activity on debris surges and roll waves;
- 12 were carried out in cooperation with the Regional Agency for Environmental Protection, Coastal Division, to analyse the available prototype data about littoral evolution along the Emilia Romagna Region, performance of existing defences and monitoring plans.

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International Refereed Journals with Impact Factor

1. Formentin S. M., Gaeta M. G., De Vecchis R., Guerrero M. & **B. Zanuttigh**, 2021. IMAGE-CLUSTERING ANALYSIS OF THE WAVE-STRUCTURE INTERACTION PROCESSES UNDER BREAKING AND NON-BREAKING WAVES, *Physics of Fluids*.
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PERSONAL CHARACTERISTICS

- Aptitude for innovation, research and development
- Strong self-discipline and a methodical and practical approach to work
- Good organizational, analytical and problem-solving skills
- Ability to work to a high standard, high level of precision even under pressure
- Capable of working on several projects contemporarily
- Positive and enthusiastic approach whilst remaining results orientated
- Good attitude at working in an interdisciplinary and international team
- Leadership skills and the ability to coordinate and motivate local and remote teams
- Good negotiation skills with key decision makers and strategists

Bologna, September 30th, 2021