PERSONAL INFORMATION

Paolo Ciavola

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Research Gate Profile
https://www.researchgate.net/profile/Paolo_Ciavola

Date of birth 21/08/1964 | Nationality Italy

Current Position Full Professor of Physical Geography and Geomorphology

Associate Researcher

Istituto per lo studio degli Impatti Antropici e Sostenibilità in ambiente marino (Consiglio Nazionale delle Ricerche), Torregrande (OR), Italy

http://oristano2.iamc.cnr.it

RESEARCH INTERESTS

Summary

My current main research interests include coastal processes, the impact of climate change on coastal morphology, the role of extreme storm events in generating coastal risk, river delta and estuarine dynamics, sedimentation in coastal lagoons. I am on the Editorial Board of Continental Shelf Research, Remote Sensing and Frontiers in Marine Sciences. I was an expert reviewer of the IPCC WGII AR5 report- Europe Chapter and I am currently a Science Officer of the European Geoscience Union for the Natural Hazard sub-group. Recently I published for Wiley two books dealing with coastal storms *(Management of the Effects of Coastal Storms: Policy, Scientific and Historical Perspectives; Coastal Storms: Processes and Impacts*). I am also an Associate Researcher to the Istituto per lo studio degli Impatti Antropici e Sostenibilità in ambiente marino (Consiglio Nazionale delle Ricerche) where I study beach morphodynamics in the Gulf of Oristano.

Bibliometric Indicators

SCOPUS: h-index 30, citations 2682, documents 105

WORK EXPERIENCE

2018- present

Full Professor of Physical Geography and Geomorphology

University of Ferrara, Italy, Department of Physics and Earth Sciences

From 1996 to 2018

Lecturer (1995-2005) and Associate Professor (2005-2018) of Physical Geography and Geomorphology

University of Ferrara, Italy, Department of Physics and Earth Sciences

From 1995 to 1996

Research Fellow

Universidade do Algarve, Faro, Portugal

Working on the study of longshore transport and developing field equipment for measurements of waves, currents and suspended sediment

From 1991 to 1995

Scientific Officer (Coastal Geologist)

British Geological Survey, Coastal Geology Group, Keyworth, UK

- Working in 1991-1992 on the Marine Aggregate Survey, Phase 4-Irish Sea, commissioned by the Crown Estates and on an assessment of the geology and geomorphology of proposed routes and landfalls for Ireland to Wales direct current electricity cables.
- Also working on the NERC's Land-Ocean Interaction Study (LOEPS sub-module). Duties included compilation of sub-surface geological data, data management for input into GIS systems, planning, drilling and logging of shallow boreholes and hand augers, geochemical and sedimentological analyses of salt marsh sediments. Member of the NORth sea Modelling Study (NORMS) Science Planning Committee for the NERC's LOIS study. Duties included science planning and refereeing of proposals for funding. Also co-ordinator of a project funded by the Environmental Know How Fund (ODA-Foreign Office) since 1994, leading to the establishment of a Coastal Geology Unit in Albania. Also consultant Coastal Geomorphologist in an Environment Impact Assessment for the construction of the new western runway of Beirut International Airport, Lebanon

From 1990 to 1991

Research Assistant

University of Hull, Institute of Estuarine and Coastal Studies, Hull, UK

Beach surveying, beach sampling, development and installation of wave recorders, development of a wave refraction computer model, numerical modelling of nearshore processes

EDUCATION AND TRAINING

1990

Laurea (M.Sc) in Geological Sciences

University of Bologna, Italy

Classification of 110/110
Thesis: Coastal Morphodynamics of Spurn Head (UK): an example of Coastal Modelling

2000

PhD in Marine Sciences, curriculum of Marine Geology

University of Algarve, Faro, Portugal

Thesis: Sediment transport processes on reflective beaches: field experiments in the Algarve

PERSONAL SKILLS

Mother tongue(s): Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	Proficient C1	Proficient C1	Proficient C1	Proficient C1	Proficient C1
	Cambridge University Proficiency Certificate				
Portuguese and Spanish	Proficient C1	Proficient C1	Proficient C1	Proficient C1	Proficient C2
	Diplomas of UK Institute of Linguists				

INSTITUTIONAL RESPONSIBILITIES

2008-today

I have considerable administrative experience as I managed as Coordinator the MICORE Project (www.micore.eu) a 3.5 million euro research project for the EU within FP7.

I have several administrative tasks within my department: Erasmus student exchange coordinator for Earth Sciences, Member of the evaluator board for internal funding assignment (FAR Programme), member of the Quality Assurance board for research productivity (SUA and VQR assessments), member of the University Directors Board of the Centre for International Cooperation.

I also coordinate a double master degree program between the University of Ferrara and the University of Cadiz in Spain. The program awards jointly awards masters in Integrated Coastal Zone Management and Geological Sciences. I coordinate for my university all administrative activities, as well as student selection at Italian level. I also teach, in Spanish, a course on coastal hazards. Further details are available on http://www.unife.it/studenti/internazionale/doppio-titolo/dipartimento-di-fisica-e-scienze-della-terra

Since 2022 I am the Coordinator of the Earth and Marine Sciences (EMAS) joint doctoral program between the University of Ferrrara and the University of Cadiz (Spain) http://www.unife.it/studenti/dottorato/it/corsi/riforma/earth#null

INTERNATIONAL GRANTS (as principal investigator)

EU FP-VI, VII and H2020

FP-VI HYDRALAB III- GWK- Hannover
Coordinator of the project HYIII-GWK-05 Experiments on Sediment Depth of Disturbance for beaches under the influence of Drainage Systems (ESDODDS).

FP-VI HYDRALAB III CIEM- Barcelona
Scientist in charge of the University of Ferrara the project HYIII- UPC-06 Swash zone response Under grouping Storm Conditions (SUSCO)

FP-VII MICORE Project http://www.micore.eu
Coordinator of the project MICORE (Morphological Impacts and COastal Risks induced by Extreme storm events) (started 01/06/2008, contract n° 202798-40 months)

FP-VII ConHaz Project http://conhaz.org
Work Package Leader (WP7 Costs of storms and coastal risks) in the project ConHaz (Costs of Natural Hazards) (started 01/02/2010, contract n° 244159-24 months)

FP-VII RISC-KIT Project http://www.risckit.eu
Work Package Leader (WP1 Database of Historical Storms) in the project RISC-KIT (Resilience-Increasing Strategies for Coasts-toolKIT) (started 01/11/2014, contract n° 603458-42 months)

H2020 ANYWHERE Project http://anywhere-h2020.eu
Task Leader (Task 2.3 Nowcasting and forecasting algorithm to assess storm surges Impacts) in the project ANYWHERE (EnhANcing emergencY management and response to extreme WeatHER and climate Events) (start date 01/06/2016, contract DRS-01-2015: 700099-39 months)

H2020 ECFAS Project www.ecfas.eu
Work Package Leader (WP5 Implementation of the coastal flood awareness system and impact assessment) in the project ECFAS (A PROOF-OF-CONCEPT FOR THE IMPLEMENTATION OF A EUROPEAN COPERNICUS COASTAL FLOOD AWARENESS SYSTEM) (start date 01/01/2021, contract LC-SPACE-18-EO-2020: 101004211-24 months)

Previous EC Frameworks

•Feed-backs of Estuarine Circulation and Transport of Sediments on Phytobenthos (F-ECTS), EU -MAST
•Sediment and Water Movement in Industrialised Estuarine Environments (SWAMIEE), EU -TMR.
•Rationale for Integrated Coastal Area Management (RICAMA), EU -LIFE
•Assessing the stability of mudflat surfaces by mapping sediment characteristics and extremely sparse vegetation and algae cover with hyperspectral imaging (HYSENS), EU -Access to Large Scale Facilities
•PRediction Of The Erosion of Cliffed Terrains (PROTECT), EU -FP5
•The COASTVIEW Project, EU-FP5

TEACHING ACTIVITY

Teaching in Degree Courses (BSc and MSc) of Engineering, Earth Sciences, Architecture and Human Sciences (Physical Geography, Coastal Dynamics, Fluvial Dynamics, GIS and Remote Sensing, Coastal Planning, Landscape Analysis). I also give supervision to Bachelor and Master thesis and PhD students

ORGANIZATION OF SCIENTIFIC MEETINGS (in the last 10 years)

2014 25-27 September 2014, Forte dei Marmi. Convegno “I° Forum Internazionale del Mare e delle Coste”.

2015 1-3 October 2015, Forte dei Marmi. Convegno “II° Forum Internazionale del Mare e delle Coste”.

2015 November 2015, Ferrara, Italia. "III°Coastal and Maritime Mediterranean Conference", http://www.paralia.fr.

2010-present COASTEXPO Ferrara http://www.remtechexpo.com/it/coast,

FURTHER INFORMATION

National and international acknowledgments

- Winner of the medal of the Societá Geologica Italiana for the best paper published in 1991 on the journal of the society
- Winner of a NATO Senior Visiting Fellowship in 1999 to the University of Algarve, Portugal
- Since 1999 he is a Life Visiting Fellow of Clare Hall College at the University of Cambridge, UK.
- Winner in 2008 of the Elsevier Award for the journal Continental Shelf Research as corresponding author of the most cited paper for the period 2003-2007 doi: 10.1016/j.csr.2002.12.001

Visiting Reseach Fellowships

- 1995- Human Capital and Mobility Programme (European Union) to study for 18 months beach processes in Portugal at the University of Algarve.
- 1999-NATO Senior Visiting Fellowship to spend two months at the University of Algarve (Faro, Portugal), to study saltmarsh geomorphology.
- 2000-Bologna-Clare Hall Visiting Fellowship to visit Clare Hall College at the

University of Cambridge to study saltmarshes in Essex (UK) and mudflats in the Scheldte Estuary (NL).

Research monographs and editorship of Special Issues

- Guest editor: UAV Application for Monitoring Coastal Morphology. Remote Sensing (ISSN 2072-4292)
- Guest editor: Monitoring and modelling to guide coastal adaptation to extreme storm events in a changing climate, Nat. Hazards Earth Syst. Sci., 16
- Guest editor: The record of marine storminess along European coastlines. Nat. Hazards Earth Syst. Sci., 13
- Guest editor: Thresholds for storm impacts along European coastlines. Geomorphology, 143-144
- Guest editor: Sediment Transport in European Estuarine Environments. Journal of Coastal Research (ISSN:0749-0208) Special Issue 41.
- Author: Management of the Effects of Coastal Storms: Policy, Scientific and Historical Perspectives Philippe Quevauviller (Editor), Paolo Ciavola, Emmanuel Garnier, ISBN: 978-1-84821-762-1, 188 pages, March 2017, Wiley-ISTE
- Author: Coastal Storms: Processes and Impacts, Paolo Ciavola, Giovanni Coco, ISBN: 978-1-118-93710-5, 280 pages, June 2017, Wiley-Blackwell

Memberships

Member of the European Geosciences Union (EGU), Italian Association of Physical Geography and Geomorphology (AIGEO), National Research Group for Coastal Environment issues (GNRAC - Gruppo Nazionale per la Ricerca sull'Ambiente Costiero)

Evaluation of research results

I currently sit on the Editorial Board of Continental Shelf Research, Remote Sensing and Frontiers in Marine Sciences, Cambridge Coastal Futures. In the past I served on the boards of the Journal of Coastal Research and the Journal of Integrated Coastal Zone Management of Portuguese Speaking Countries.

I am a member of the Management Board of the National Research Group for Coastal Environment issues (GNRAC - Gruppo Nazionale per la Ricerca sull'Ambiente Costiero).

Referee of the following international journals: Caribbean Journal of Science, Geo-Marine Letters, Marine Geology, International Journal of Remote Sensing, Journal of Geophysical Research, Coastal Engineering, Ocean and Coastal Management, Natural Hazard and Earth System Sciences, Journal of Risk Research, Journal of Environmental Management, Scientific Reports.

Expert reviewer of the IPCC WGII AR5 report- Europe Chapter

Evaluator of EU-FP7 proposals-Environment Theme and EU-Bonus (Baltic Sea research proposals)

Evaluator of EU-COST Proposals

Evaluator of FCT (Portuguese Science Foundation) proposals

Evaluator of NERC (Natural Environment Research Council) UK proposals

Member of the IOC-UNESCO working Group on Coastal Risk

Earth Science Panel member on behalf of the Ministry of Education, Science, Research and Sport of the Slovak Republic, for the Periodic Evaluation of Slovak higher education and public research institutions during the period of 2014-2019

Personal data

According to law 679/2016 of the Regulation of the European Parliament of 27 April 2016, I hereby express my consent to process and use my data provided in this CV

Date: Ferrara, 9/19/23

Signature: Paolo Ciavola

Publications

International Journals

1. Fullin N., Duo E., Fabbri S., Francioni M., Ghirotti M., **Ciavola P.** (2023). Quantitative Characterization of Coastal Cliff Retreat and Landslide Processes at Portonovo–Trave Cliffs (Conero, Ancona, Italy) Using Multi-Source Remote Sensing Data. *Remote Sensing*. *15(17):4120*. https://doi.org/10.3390/rs15174120

2. Souto-Ceccon P, Simarro G, **Ciavola P**, Taramelli A, Armaroli C. (2023). Shoreline Detection from PRISMA Hyperspectral Remotely-Sensed Images. *Remote Sensing*. *15(8):2117*. https://doi.org/10.3390/rs15082117

3. Cilli, S., Billi, P., Schippa, L., Grottoli, E., & **Ciavola, P.** (2021). Bedload transport and dune bedforms characteristics in sand-bed rivers supplying a retreating beach of the northern Adriatic Sea (Italy). *Journal of Hydrology: Regional Studies*, *37*, 100894. https://doi.org/10.1016/j.ejrh.2021.100894

4. Brunetta, R., Duo, E., **Ciavola, P.** (2021). Evaluating Short-Term Tidal Flat Evolution Through UAV Surveys: A Case Study in the Po Delta (Italy). *Remote Sensing. 13(10)*, 2322. https://doi.org/10.3390/rs13122322

5. Fabbri, S., Grottoli, E., Armaroli, C. & **Ciavola, P.** (2021). Using High-Spatial Resolution UAV-Derived Data to Evaluate Vegetation and Geomorphological Changes on a Dune Field Involved in a Restoration Endeavour. *Remote Sensing. 13(10)*, 1987. https://doi.org/10.3390/rs13101987

6. Duo, E., Fabbri, S., Grottoli, E. & **Ciavola, P**. (2021). Uncertainty of Drone-Derived DEMs and Significance of Detected Morphodynamics in Artificially Scraped Dunes. *Remote Sensing*, *13(9)*, 1823. https://doi.org/10.3390/rs13091823

7. Fernández-Montblanc, T., Gómez-Enri, J., & **Ciavola, P.** (2020). The Role of Mean Sea Level Annual Cycle on Extreme Water Levels Along European Coastline. *Remote Sensing*, *12*(20), 3419. https://doi.org/10.3390/rs12203419

8. Duo, E., Sanuy, M., Jiménez, J. A., & **Ciavola, P.** (2020). How good are symmetric triangular synthetic storms to represent real events for coastal hazard modelling. *Coastal Engineering*, 103728. https://doi.org/10.1016/j.coastaleng.2020.103728

9. Grottoli, E., Cilli, S., **Ciavola, P.,** & Armaroli, C. (2020). Sedimentation at River Mouths bounded by Coastal Structures: A Case Study along the Emilia-Romagna Coastline, Italy. *Journal of Coastal Research*, *95*(sp1), 505-510. https://doi.org/10.2112/SI95-098.1

10. Fernández-Montblanc, T., Duo, E., & **Ciavola, P**. (2020). Dune reconstruction and revegetation as a potential measure to decrease coastal erosion and flooding under extreme storm conditions. *Ocean & Coastal Management*, 105075. https://doi.org/10.1016/j.ocecoaman.2019.105075

11. Fernández-Montblanc, T., Vousdoukas, M. I., Mentaschi, L., & **Ciavola, P.** (2020). A Pan-European high resolution storm surge hindcast. *Environment International*, *135*, 105367. https://doi.org/10.1016/j.envint.2019.105367

12. Brunetta, R., **Ciavola, P.,** & De Paiva, J. S. (2019). Morphological evolution of an intertidal area following a set-back scheme: a case study from the Perkpolder Basin (The Netherlands). *Frontiers in Earth Science*, *7*, 228. https://doi.org/10.3389/feart.2019.00228

13. Grottoli, E., & **Ciavola, P.** (2019). The role of detailed geomorphic variability in the vulnerability assessment of potential oil spill events on mixed sand and gravel beaches: the cases of two Adriatic sites. *Frontiers in Earth Science*, *7*, 242. https://doi.org/10.3389/feart.2019.00242

14. Schippa, L., Cilli, S., **Ciavola, P.,** & Billi, P. (2019). Dune Contribution to Flow Resistance in Alluvial Rivers. *Water*, *11*(10), 2094. https://doi.org/10.3390/w11102094

15. Grottoli, E., Bertoni, D., Pozzebon, A., & **Ciavola, P.** (2019). Influence of particle shape on pebble transport in a mixed sand and gravel beach during low energy conditions: Implications for nourishment projects. *Ocean & Coastal Management*, *169*, 171-181. doi: https://doi.org/10.1016/j.ocecoaman.2018.12.014

16. Fernández-Montblanc, T., Vousdoukas, M. I., **Ciavola, P.,** Voukouvalas, E., Mentaschi, L., Breyiannis, G., ... &

Salamon, P. (2019). Towards robust pan-European storm surge forecasting. *Ocean Modelling*, *133*, 129-144. doi: https://doi.org/10.1016/j.ocemod.2018.12.001

17. Sanuy, M., Duo, E., Jäger, W. S., **Ciavola, P.,** and Jiménez, J. A.(2018). Linking source with consequences of coastal storm impacts for climate change and risk reduction scenarios for Mediterranean sandy beaches, Nat. Hazards Earth Syst. Sci., 18, 1825-1847, https://doi.org/10.5194/nhess-18-1825-2018.
18. Duo, E., Trembanis, A. C., Dohner, S., Grottoli, E., & **Ciavola, P.** (2018). Local-scale post-event assessments with GPS and UAV-based quick-response surveys: a pilot case from the Emilia–Romagna (Italy) coast. *Natural Hazards & Earth System Sciences*, *18*(11). doi: https://www.nat-hazards-earth-syst-sci.net/18/2969/2018/
19. Pratellesi, M., **Ciavola, P.,** Ivaldi, R., Anthony, E. J., Armaroli, C. (2018). River-mouth geomorphological changes over 135 years (1882–2014) in a small Mediterranean delta: Is the Magra delta reverting to an estuary?. *Marine Geology*. doi: https://doi.org/10.1016/j.margeo.2018.06.003
20. Novák-Szabó, T., Sipos, A. Á., Shaw, S., Bertoni, D., Pozzebon, A., Grottoli, E., Sarti, G., **Ciavola, P.,** Domokos, G., Jerolmack, D. J. (2018). Universal characteristics of particle shape evolution by bed-load chipping. *Science Advances*, eaao4946, doi: 10.1126/sciadv.aao4946
21. Van Dongeren, A., **Ciavola, P.,** Martinez, G., Viavattene, C., Bogaard, T., Ferreira, O., ... & McCall, R. (2018). Introduction to RISC-KIT: Resilience-increasing strategies for coasts. *Coastal Engineering*, *134*, 2-9. doi: https://doi.org/10.1016/j.coastaleng.2017.10.007
22. Garnier, E., **Ciavola, P.,** Spencer, T., Ferreira, O., Armaroli, C., & McIvor, A. (2018). Historical analysis of storm events: Case studies in France, England, Portugal and Italy. *Coastal Engineering*, *134*, 10-23. doi: http://dx.doi.org/10.1016/j.coastaleng.2017.06.014
23. **Ciavola, P.,** Harley, M. D., & den Heijer, C. (2018). The RISC-KIT storm impact database: a new tool in support of DRR. *Coastal Engineering*, *134*, 24-32. doi: https://doi.org/10.1016/j.coastaleng.2017.08.016
24. Ninfo A, **Ciavola P.,** Billi, P. (2018). The Po Delta is restarting progradation: geomorphological evolution based on a 47-years Earth Observation dataset. *Scientific Reports*, doi: 10.1038/s41598-018-21928-3
25. Billi, P., Salemi, E., Preciso, E., **Ciavola, P**., & Armaroli, C. (2017). Field measurement of bedload in a sand-bed river supplying a sediment starving beach. *Zeitschrift für Geomorphologie*, *61*(3), 207-223, doi: https://doi.org/10.1127/zfg/2017/0466
26. Grottoli, E., Bertoni, D., & **Ciavola, P.** (2017). Short-and medium-term response to storms on three Mediterranean coarse-grained beaches. *Geomorphology*, *295*, 738-748, doi: https://doi.org/10.1016/j.geomorph.2017.08.007
27. Bertoni, D., Sarti, G., Grottoli, E., **Ciavola, P.,** Pozzebon, A., Domokos, G., & Novák-Szabó, T. (2016). Impressive abrasion rates of marked pebbles on a coarse-clastic beach within a 13-month timespan. *Marine Geology*, *381*, 175-180. doi: http://dx.doi.org/10.1016/j.margeo.2016.09.010
28. Brown, J. M., **Ciavola, P.,** Masselink, G., McCall, R., and Plater, A. J. (2016): Preface: Monitoring and modelling to guide coastal adaptation to extreme storm events in a changing climate, Nat. Hazards Earth Syst. Sci., 16, 463-467 https://doi.org/10.5194/nhess-16-463-2016
29. Harley, M. D., Valentini, A., Armaroli, C., Perini, L., Calabrese, L., and **Ciavola, P**. (2016): Can an early warning system help minimize the impacts of coastal storms? A case study of the 2012 Halloween storm, Northern Italy, Nat. Hazards Earth Syst. Sci., 16, 209–222, https://doi.org/10.5194/nhess-16-209-2016
30. Perini, L., Calabrese, L., Salerno, G., **Ciavola, P.,** and Armaroli, C. (2016). Evaluation of coastal vulnerability to flooding: comparison of two different methodologies adopted by the Emilia-Romagna region (Italy), Nat. Hazards Earth Syst. Sci., 16, 181-194, https://doi.org/10.5194/nhess-16-181-2016
31. Grottoli, E., Bertoni, D., **Ciavola, P.,** and Pozzebon, A. (2015). Short term displacements of marked pebbles in the swash zone: Focus on particle shape and size. Marine Geology, 367, 143-158. https://doi.org/10.1016/j.margeo.2015.06.006
32. Nordstrom, K.F., Armaroli, C., Jackson, N.L., **Ciavola**, P. (2015). Opportunities and constraints for managed retreat on exposed sandy shores: Examples from Emilia-Romagna, Italy, Ocean & Coastal Management, 104, pp. 11-21. https://doi.org/10.1016/j.ocecoaman.2014.11.010
33. Taramelli, A., Di Matteo, L., **Ciavola**, P., Guadagnano, F., and Tolomei, C. (2015). Temporal evolution of patterns and processes related to subsidence of the coastal area surrounding the Bevano River mouth (Northern Adriatic)–Italy. Ocean & Coastal Management, 108, 74-88, https://doi.org/10.1016/j.ocecoaman.2014.06.021

34. Kreibich, H., van den Bergh, J. C., Bouwer, L. M., Bubeck, P., **Ciavola**, P., Green, C., ... and Thieken, A. H. (2014). Costing natural hazards. NATURE CLIMATE CHANGE, 4(5), 303-306, https://doi.org/10.1038/nclimate2182

35. Van Dongeren A.R., **Ciavola** P., Viavattene C. et al. (2014) RISC-KIT: Resilience-Increasing Strategies for Coasts – toolkit. JOURNAL OF COASTAL RESEARCH, Special Issue No. 70, 366–371.

36. Harley, M. D., Andriolo, U., Armaroli, C., & **Ciavola**, P**.** (2013). Shoreline rotation and response to nourishment of a gravel embayed beach using a low-cost video monitoring technique: San Michele-Sassi Neri, central Italy. J COAST CONSERV. https://doi.org/10.1007/s11852-013-0292-x

37. **Ciavola** P., Contestabile P., Aristodemo F., Vicinanza D. (2013). Beach sediment mixing under drained and undrained conditions. JOURNAL OF COASTAL RESEARCH (ISSN:0749-0208) pp. 1503- 1508 Vol. SI65.

38. Bertoni, D., Grottoli, E., **Ciavola, P.,** Sarti, G., Benelli, G., and Pozzebon, A. (2013). On the displacement of marked pebbles on two coarse-clastic beaches during short fair-weather periods (Marina di Pisa and Portonovo, Italy). Geo-Marine Letters, *33*(6), 463-476. https://doi.org/10.1007/s00367-013-0341-3

39. **Ciavola** P., Jimenez J.A. (2013). The record of marine storminess along European coastlines. NATURAL HAZARDS AND EARTH SYSTEM SCIENCES (ISSN:1684-9981) pp.1999- 2002 Vol.13, https://doi.org/10.5194/nhess-13-1999-2013

40. Armaroli C., Grottoli E., Harley M.D., **Ciavola** P. (2013). Beach morphodynamics and types of foredune erosion generated by storms along the Emilia-Romagna coastline, Italy. Geomorphology, 199, 22- 35, https://doi.org/10.1016/j.geomorph.2013.04.034

41. Meyer, V., Becker, N., Markantonis, V., Schwarze, R., van den Bergh, J. C. J. M., Bouwer, L. M., Bubeck, P., **Ciavola, P.,** Genovese, E., Green, C., Hallegatte, S., Kreibich, H., Lequeux, Q., Logar, I., Papyrakis, E., Pfurtscheller, C., Poussin, J., Przyluski, V., Thieken, A. H., and Viavattene, C. (2013): Review article: Assessing the costs of natural hazards – state of the art and knowledge gaps, Nat. Hazards Earth Syst. Sci., 13, 1351-1373, https://doi.org/10.5194/nhess-13-1351-2013

42. Harley M., **Ciavola** P. (2013). Managing local coastal inundation risk using real-time forecasts and artificial dune placements. Coastal Engineering, 77, pp. 77- 90, https://doi.org/10.1016/j.coastaleng.2013.02.006

43. Armaroli C., **Ciavola** P., Perini L., Calabrese L., Lorito S., Valentini A., Masina M. (2012). Critical storm thresholds for significant morphological changes and damage along the Emilia-Romagna coastline, Italy. Geomorphology, 143-144, pp. 34- 51, https://doi.org/10.1016/j.geomorph.2011.09.006.

44. Contestabile P., Aristodemo F., Vicinanza D., **Ciavola** P. (2012). Laboratory study on a beach drainage system. Coastal Engineering, 66, pp. 50- 64, https://doi.org/10.1016/j.coastaleng.2012.03.012

45. **Ciavola** P, Stive M.J.F. (2012). Thresholds for storm impacts along European coastlines: Introduction. Geomorphology, 143-144, pp. 1- 2, https://doi.org/10.1016/j.geomorph.2011.10.002

46. Armaroli, C., **Ciavola**, P. (2011). Dynamics of a nearshore bar system in the northern Adriatic: a video-based morphological classification. Geomorphology, 126, pp. 201- 216, https://doi.org/10.1016/j.geomorph.2010.11.004

47. **Ciavola** P., Vicinanza D., Aristodemo F., Contestabile P. (2011). Large-scale morphodynamic experiments on a beach drainage system. JOURNAL OF HYDRAULIC RESEARCH (ISSN:0022-1686) pp. 523- 528 Vol.49.

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