

## **Sergio Fagherazzi**

Department of Earth and Environment, Marine Program  
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### **Correspondence**

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### **Education**

Doctoral Degree in Hydrodynamics, Ph.D. (February 1999), Department of Environmental, Maritime, Geotechnical, and Hydraulic Engineering, University of Padua (Italy) Title: *Tidal channel networks*. Advisor: A. Rinaldo

Degree in Hydraulic Civil Engineering, B.S. and M.S., (March 1995, Summa cum Laude), University of Padua (Italy) Title : *Dispersion and diffusion of passive contaminants in tidal basins*. Advisors L. D'Alpaos and A. Defina.

### **Academic Appointments**

Full Professor (March 2017 – present), Department of Earth and Environment, Boston University, Boston MA.

Associate Professor (July 2012 – March 2017), Department of Earth and Environment, Boston University, Boston MA.

Associate Professor (September 2010 – July 2012), Department of Earth Sciences, Boston University, Boston MA.

Associate (September 2007 – present), Marine Program, Boston University, Boston MA

Associate (January 2007 – present), Center for Computational Science, Boston University, Boston MA

Assistant Professor (January 2007 – September 2010), Department of Earth Sciences, Boston University, Boston MA.

Assistant Professor (August 2002 – December 2006), Department of Geological Sciences, Florida State University, Tallahassee FL.

Associate (August 2002 – December 2006), School of Computational Science, Florida State University, Tallahassee FL.

Associate (March 2004- December 2006), Geophysical Fluid Dynamics Institute, Florida State University, Tallahassee FL.

Postdoctoral Research Associate (April 2001 – August 2002), Department of Environmental Sciences, University of Virginia, Charlottesville VA.

Postdoctoral Research Associate (April 1999 – April 2001), Department of Geological Sciences and School of Computational Science & Information Technology, Florida State University, Tallahassee, FL.

### **Visiting Positions**

Visiting Associate in Geology (January 2014 – April 2014). Division of Geology and Planetary Science, California Institute of Technology.

Research Visiting Scholar, Department IMAGE, University of Padua, May 2011

Visiting Scholar, Department IMAGE, University of Padua, May 2010

Research Fellow (June 1998- November 1998), Department of Earth and Planetary Sciences, University of California, Berkeley, CA.

### **Honors and Awards**

American Geophysical Union Fellow 2023

*JJ Mehta Award* for outstanding contributions to the study of cohesive sediment dynamics 2017

*Brunings Lecture* Department of Physical Geography, Utrecht University, January 10 2017

*Augusto Ghetti Prize* for scientific studies on the Venice Lagoon, Italy. Venetian Academy of Arts and Sciences 2014

*Keynote speaker.* The Tide Rises, the Tide Falls: Morphodynamics of Lagoons, The 8<sup>th</sup> Symposium on river, Coastal and Estuarine Morphodynamics, Santander, June 9-13 2013

*Editors' Citation for Excellence in Refereeing*, Journal of Geophysical Research, American Geophysical Union, 2004

*Prof. Aldo Gini Fellowship* (April 2000-April 2001) for studies and research abroad, Gini Foundation, Padua, Italy.

*Borsa di studio per perfezionamento all'estero* (April 1999-April 2000) Fellowship for studies and Research abroad, Università degli Studi di Padova Italy.

*Prof. Aldo Gini Fellowship* (April 1999 - April 2000) for studies and research abroad, Gini Foundation, Padua, Italy.

*Summa Cum Laude* distinction University of Padua, Italy, 1995.

### **Editorial Boards**

Advances in Water Resources, Elsevier, Editorial Board 2014 - present

Earth Surface Processes and Landforms, Wiley Pub., Editorial Advisory Board 2008 – present

### **Special Issue Guest Editor**

Torres R., Hopkinson C., Fagherazzi S., and van Proosdij D., (Eds.) Salt Marsh Geomorphology: Physical and Ecological Effects on Landform, Special Issue, *Estuarine, Coastal and shelf Science* Vol. 69, Issue 3-4 Pages 309-437.

### **Guest Editor**

Proceedings of the National Academy of Sciences

### **International Meetings Organized**

AGU Chapman Conference on Salt Marsh Geomorphology: Physical and Ecological Effects on Landform, with R. Torres, D. van Proosdij, and C. Hopkinson, Halifax, Nova Scotia, Canada 9-13 October 2004

Program Committee AGU Chapman Conference Hydrogeomorphic Feedbacks and Sea Level Rise in Tidal Freshwater River Ecosystems, Reston Virginia USA 13-16 November 2012

### **Professional Activities**

Co-Principal Investigator NSF Virginia Coast Reserve LTER (2006-present)

Co-Principal Investigator NSF Plum Island Ecosystems LTER (2012-present)

NASA panelist IDS program January 2023

Convener (with Hamed Moftakhari, Anner Paldor) Special Session, “Coastal Hydrology” Fall meeting AGU, Chicago, 2022

Presentation: Effects of Sea Level Rise on Shoreline Degradation and Erosion in BOEM/ Argonne Webinar: Effects of Greenhouse Gas Emissions and Climate Change on U.S. Coastal and Marine Environments March 14 2022

Convener (with Hamed Moftakhari, Yu-Ping Chin) Special Session, “Coastal Hydrology: Physical and Biogeochemical Processes” Fall meeting AGU, New Orleans, 2021

NSF panelist NNA-RCN panelist 2017

Presentation, Northeast wide Refuge Biologist Workshop, West Virginia, 3/23/2016

NSF panelist Geomorphology and Land-use Dynamics 2015

Presentation, Great Marsh Resiliency Modeling Workshop Monday, Parker River National Wildlife Refuge, April 11, 2016

Presentation, Sea-Level Rise, Storms and Coastal Impacts, CafeSci Boston, organized by NOVA and WGBH Educational Foundation 2015

Presentation, Barnegat Bay SAGE Community of Practice meeting Tuesday, Oct 13 2015

Member Ecohydrology Technical Committee of the Hydrology Section of the American Geophysical Union, 2015-2016

Convener (with W Nardin and G. Okin) Session: “Ecogeomorphology: feedbacks between biota and sediment transport at the earth surface”, Fall meeting AGU, San Francisco, 2014

NSF panelist Geomorphology and Land-use Dynamics 2014

Program Committee. AGU Chapman Conference Hydrogeomorphic Feedbacks and Sea Level Rise in Tidal Freshwater River Ecosystems, Reston Virginia USA 13-16 November 2012

Convener (with G Mariotti and E. Istanbulluoglu) Session: “Ecogeomorphology: Footprints on a Landscape”, Fall meeting AGU, San Francisco, 2012

NSF panelist Sustainability Network Research SNR 2012

AGU Fall Meeting 2011 Program Committee for EPSP

NSF Sustainable Energy Pathways Workshop, Minneapolis, Minnesota, October 5-7, 2011

U.S. Department of Energy's Office of Nonproliferation and Verification Research and Development, independent reviewer, Savannah River National Laboratory, 2011.

Convener (with C Palinkas) Session: "Geomorphological and Ecological Processes in Tidal Flats and Wetlands", Fall meeting AGU, San Francisco, 2010

Executive Committee, Earth and Planetary Surface Processes Focus Group, American Geophysical Union

Member, NSF Community Surface Dynamics Modeling System (CSDMS) Coastal Working Group 2007-present

NSF panelist EAR Geomorphology and Land Use Dynamics 2010

Student Travel Award Committee, Fall Meeting 2010, American Geophysical Union

Reviewer: NSF report from the NRC - Committee on Challenges and Opportunities in Earth Surface Processes

Convener (with M Kirwan; P Barnard), Special Session, "Coastal Geomorphology and Morphodynamics", Fall meeting AGU, San Francisco, 2008

Chair Session IV – Sediment Transport, AGU Chapman Conference on Physics of Wave-Mud Interaction, Amelia Island, Florida, USA, 17–20 November 2008

Convener (with Zoe Hughes and Britt Argow) Session 141 "Hydrodynamics and Morphodynamics of Marshes and Shallow Coastal Environments" 2008 Ocean Sciences Meeting, Orlando Florida, March 2-7.

Convener (with S. Lanzoni) Session D1.b "Hydrodynamics and morphodynamics of estuarine systems" 32 Congress IAHR, Venice, July 1-6 2007

Convener (with S. Tao), Special Session, "Physical Processes in Salt Marshes and Barrier Islands", Spring meeting AGU, Washington, 2002

Reviewer for: Science, Nature, Nature Geoscience, Reviews of Geophysics, Geology, Water Resources Research, Geophysical Research Letters, Earth Surface Processes and Landforms, Mechanics Research Communications, Journal of Sedimentary Research, Journal of Geophysical Research, Journal of Hydraulic Engineering ASCE, Journal of Marine Systems, Advances in Water Resources, Revista de la Asociacion Argentina de Sedimentologia, Journal of Engineering Mathematics, Ecological Applications, National Science Foundation, U.S. Civilian Research and Development Foundation, Dutch Technology Foundation STW

Registered Professional Engineer, Venice Province, Italy

## Students and Postdoctoral Associates

### Supervised Students

Florida State University:

Muriel Hannion (MS)

Anthony Priestas (MS)

Boston University:

Christine Harrington (MA)

Tammy Viggato (MA), “The effect of evaporation and nutrient enrichment on the erodability of mudflats in a mesotidal estuary“ 2013

Giulio Mariotti (PhD) “Morphodynamics of Shallow coastal Bays“ 2013

Anthony Priestas (PhD) “Salt Marsh Shoreline Erosion and Sediment Exchange in an Open Coast and Coastal Lagoon Setting” 2013

Nicoletta Leonardi (PhD) “Modeling the effect of Marine Processes on Deltaic Wetland” 2015

Irene Palazzoli (MA) “Identification of the most effective factors responsible for the flushing of a tracer in a system of shallow bays” 2017

Arnold Fernandes (MA) “The impact of extreme storm surges on Mid-Atlantic coastal forests” 2017

William Kearney (PhD) “Signals of Nonlinear, Multiscale and Stochastic Processes in Coastal Landscapes” 2018

Xiaohe Zhang (PhD) “Exploring sediment dynamics in coastal bays by numerical modeling and remote sensing” 2020

Amani AlAbri (PhD) “morphological response of arid, carbonate watersheds in oman to climatic and tectonic forcing” 2021

Giovanna Nordio (PhD) "Long-term Research of Groundwater Level and Salinity Dynamics in Coastal Forests Bordering Salt Marshes in the Delmarva Peninsula (VA): Forest Retreat and Marsh Expansion as Consequences of Sea Level Rise (SLR) Flooding and Salinization" 2023

International Visiting Students: Luca Carniello (PhD, University of Padua, Italy), Andrea D’Alpaos (PhD, University of Padua, Italy), Giorgia Fosser (MS, University of Padua Italy), Riccardo Masetti (MS, University of Bologna, Italy), Carmen Palermo (MS, Polytechnic of Milan, Italy), Alberto Canestrelli (PhD, University of Padua, Italy) Mara Tonelli (PhD,

University of Udine, Italy), William Nardin (PhD, University of Rome, Italy), Luca Baticci (MS, Polytechnic of Milan, Italy), Nicoletta Leonardi (MS, University of Pisa, Italy), Daniele La Cecilia (MS University of Trento, Italy), Hongyi Yao (PhD East China Normal University, China), Silvia Locatelli (MS, Polytechnic of Milan, Italy), Alfonso Jiménez-Robles (PhD University of Granada, Spain), Xiaohu Zhang (MS East China Normal University, China), Chao Sun (PhD Nanjing University, China), Huan Mi (PhD Tongji University, China), Weina Zhang (Hohai University, China), Daniele Catucci (University of Ancona, Italy), Jie Wang (East China Normal University, China), Yiwei Lyu (Wuhan University, China), Zezheng Liu (Beijing Normal University, China), Lorenzo Durante (Genoa University, Italy).

### **Undergraduate Honor Thesis**

2015 Sarah Margolis, honor thesis, “An analysis of soil chemistry in relation to the growth rates of *Ammophila breviligulata*, *Uniola paniculata* and *Spartina patens* in the coastal dune environment of Hog Island, Virginia”

2013 Kendall Valentine, honor thesis: “The Effect of Physical and Biological Processes on the erosion of Cohesive Sediments“, two published articles

### **Current Students**

Luca Cortese (PhD Boston University), Yiyang Xu (PhD Boston University), Amirhossein Noori (PhD Boston University), Jordi Palacio (PhD Boston University)

### **Supervised Postdoctoral Associates**

Federico Falcini (Boston University)

Alberto Canestrelli (Boston University)

William Nardin (Boston University)

Olivier Gourgue (Boston University)

Xiaohe Zhang (Boston University)

Carmine Donatelli (Boston University)

Daghan Xie (Boston University)

Silke Tas (Boston University)

### **List of Publications**

#### **Edited Books**

Fagherazzi S., Marani M., and Blum L.K. (Editors) , *The Ecogeomorphology of Tidal Marshes*, American Geophysical Union Coastal and Estuarine Studies, Washington DC, Volume 59, 266 pages, 2004

## Invited Review Papers

Fagherazzi, S., D. A. Edmonds, W. Nardin, N. Leonardi, A. Canestrelli, F. Falcini, D. Jerolmack, G. Mariotti, J. C. Rowland, and R. L. Slingerland (2015), Dynamics of River Mouth Deposits, *Rev. Geophys.*, 53, doi:10.1002/2014RG000451.

Fagherazzi S. Kirwan M.L., Mudd S.M., Guntenspergen G.R., Temmerman S., D'Alpaos A., van de Koppel J., Rybczyk J.M., Reyes E., Craft C., Clough J., (2012). Numerical Models of Salt Marsh Evolution: Ecological and Climatic Factors, *Reviews of Geophysics* 50, 1, doi:10.1029/2011RG000359

Fagherazzi S., Overeem I., Models of Deltaic and Inner Continental Shelf Landform Evolution, *Annual Review of Earth and Planetary Sciences* Vol. 35: 685-715, 2007

## Special Issue Guest Editor

Torres R., Hopkinson C., Fagherazzi S., and van Proosdij D., (Eds.) Salt Marsh Geomorphology: Physical and Ecological Effects on Landform, Special Issue, *Estuarine, Coastal and shelf Science* Vol. 69, Issue 3-4 Pages 309-437.

## Journals

(\* denotes student or postdoc co-author)

## Published:

159. Wang, J., Dai, Z., Fagherazzi, S., Lou, Y., Mei, X. and Ma, B., 2023. Large-scale sedimentary shift induced by a mega-dam in deltaic flats. *Sedimentology*. 10.1111/sed.13168
158. Cortese, L.\*, Donatelli, C.\*, Zhang, X.\*, Nghiem, J. A., Simard, M., Jones, C. E., Denbina, M., Fichot, C. G., Harringmeyer, J. P., and Fagherazzi, S. 2023. Coupling numerical models of deltaic wetlands with AirSWOT, UAVSAR, and AVIRIS-NG remote sensing data, *Biogeosciences Discuss*. <https://doi.org/10.5194/bg-2023-108>,
157. Donatelli, C.\*, Passalacqua, P., Jensen, D., Oliver-Cabrera, T., Jones, C. E., & Fagherazzi, S. 2023. Spatial variability in salt marsh drainage controlled by small scale topography. *Journal of Geophysical Research: Earth Surface*, 128, e2023JF007219. <https://doi.org/10.1029/2023JF007219>
156. Cortese, L.\*, Jensen, D. J., Simard, M., & Fagherazzi, S. 2023. Using normalize difference vegetation index to infer wetlands salinity and organic contribution to vertical accretion rates. *Journal of Geophysical Research: Biogeosciences*, 128, e2023JG007631. <https://doi.org/10.1029/2023JG007631>

155. Feagin, R.A., Chang, K.A., Huff, T.P., Rodriguez-Iturbe, I., Kim, J.Y., Kaihatu, J., Leonardi, N. and Fagherazzi, S., 2023. An asymmetry in wave scaling drives outsized quantities of coastal wetland erosion. *Science Advances*, 9(45), p.eadj2602.
154. Jin, S., Fagherazzi, S., Fichot, C.G., Wu, X., Liu, Y.X., Zheng, X., Zou, T. and Xing, Q., 2023. Drivers of suspended sediment dynamics along the shorelines of the Yellow River Delta detected from satellite data. *Earth Surface Processes and Landforms*. <https://doi.org/10.1002/esp.5683>
153. Khojasteh, D., Haghani, M., Nicholls, R.J., Moftakhari, H., Sadat-Noori, M., Mach, K.J., Fagherazzi, S., Vafeidis, A.T., Barbier, E., Shamsipour, A. and Glamore, W., 2023. The evolving landscape of sea-level rise science from 1990 to 2021. *Communications earth & environment*, 4(1), p.257.
152. Reeves, I.R.B., Moore, L.J., Valentine, K., Fagherazzi, S. and Kirwan, M.L., 2023. Sediment exchange across coastal barrier landscapes alters ecosystem extents. *Geophysical Research Letters*, 50(14), p.e2023GL103680.
151. Yang J., Z. Dai, Y. Lou, X. Mei, S. Fagherazzi, 2023 Image-based machine learning for monitoring the dynamics of deltaic islands in the Atchafalaya River Delta Complex between 1991 and 2019, *Journal of Hydrology*, 129814, ISSN 0022-1694, <https://doi.org/10.1016/j.jhydrol.2023.129814>.
150. Nordio, G.\* and Fagherazzi, S., 2023. Recovery of salt marsh vegetation after ice-rafting. *Marine Ecology Progress Series*, 710, pp.57-70.
149. Donatelli, C.\*, Passalacqua, P., Wright, K., Salter, G., Lamb, M. P., Jensen, D., & Fagherazzi, S. 2023. Quantifying flow velocities in river deltas via remotely sensed suspended sediment concentration. *Geophysical Research Letters*, 50, e2022GL101392. <https://doi.org/10.1029/2022GL101392>
148. Nordio, G.\*, Frederiks, R., Hingst, M., Carr, J., Kirwan, M., Gedan, K., et al. 2023. Frequent storm surges affect the groundwater of coastal ecosystems. *Geophysical Research Letters*, 50, e2022GL100191. <https://doi.org/10.1029/2022GL100191>
147. Liu, Z., Fagherazzi, S., Liu, X., Shao, D., Miao, C., Cai, Y., Hou, C., Liu, Y., Li, X. and Cui, B., 2022. Long-term variations in water discharge and sediment load of the Pearl River Estuary: Implications for sustainable development of the Greater Bay Area. *Frontiers in Marine Science*, p.2457.
146. Stopak, S.; Nordio, G.\*; Fagherazzi, S.; Quantifying the Importance of Ice-Rafted Debris to Salt Marsh Sedimentation Using High Resolution UAS Imagery. *Remote Sens.* 2022, 14, 5499. <https://doi.org/10.3390/rs14215499>



145. Wang, J.\*, Dai, Z., Fagherazzi, S. and Long, C., 2022. A novel approach to discriminate sedimentary characteristics of deltaic tidal flats with terrestrial laser scanner: Results from a case study. *Sedimentology*, 69(4), pp.1626-1648.
144. Jensen, D.J., Cavanaugh, K.C., Thompson, D.R., Fagherazzi, S., Cortese, L.\* and Simard, M., 2022. Leveraging the Historical Landsat Catalog for a Remote Sensing Model of Wetland Accretion in Coastal Louisiana. *Journal of Geophysical Research: Biogeosciences*, 127(6), p.e2022JG006794.
143. Gourgue, O.\*, van Belzen, J., Schwarz, C., Vandenbruwaene, W., Vanlede, J., Belliard, J.P., Fagherazzi, S., Bouma, T.J., van de Koppel, J. and Temmerman, S., 2022. Biogeomorphic modeling to assess the resilience of tidal-marsh restoration to sea level rise and sediment supply. *Earth Surface Dynamics*, 10(3), pp.531-553.
142. Xu, Y.\*, Kalra, T. S., Ganju, N. K., & Fagherazzi, S. (2022). Modeling the dynamics of salt marsh development in coastal land reclamation. *Geophysical Research Letters*, 49, e2021GL095559. <https://doi.org/10.1029/2021GL095559>
141. Cortese, L.\* and Fagherazzi, S., 2022. Fetch and distance from the bay control accretion and erosion patterns in Terrebonne marshes (Louisiana, USA). *Earth Surface Processes and Landforms*. <https://doi.org/10.1002/esp.5327>
140. Nordio, G.\* and Fagherazzi, S., 2022. Storm surge and tidal dissipation in deltaic wetlands bordering a main channel. *Journal of Geophysical Research: Oceans*, 127, e2021JC017655. <https://doi.org/10.1029/2021JC017655>
139. Nordio, G.\* and Fagherazzi, S., 2022. Salinity increases with water table elevation at the boundary between salt marsh and forest. *Journal of Hydrology*, p.127576.
138. Zhang, X.\*, Wright, K., Passalacqua, P., Simard, M., & Fagherazzi, S., 2022. Improving channel hydrological connectivity in coastal hydrodynamic models with remotely sensed channel networks. *Journal of Geophysical Research: Earth Surface*, 127, e2021JF006294. <https://doi.org/10.1029/2021JF006294>
137. Zhang, X.\*, Jones, C.E., Oliver-Cabrera, T., Simard, M. and Fagherazzi, S., 2022. Using rapid repeat SAR interferometry to improve hydrodynamic models of flood propagation in coastal wetlands. *Advances in Water Resources*, 159, p.104088.
136. Wang, J.\*, Dai, Z., Fagherazzi, S., Zhang, X. and Liu, X., 2022. Hydro-morphodynamics triggered by extreme riverine floods in a mega fluvial-tidal delta. *Science of The Total Environment*, 809, p.152076.
135. Zhao, B., Liu, Y., Wang, L., Liu, Y., Sun, C. and Fagherazzi, S., 2022. Stability evaluation of tidal flats based on time-series satellite images: A case study of the Jiangsu central coast, China. *Estuarine, Coastal and Shelf Science*, 264, p.107697.

134. Liu Z.\*, O. Gourgue\*, S. Fagherazzi 2022. Biotic and abiotic factors control the geomorphic characteristics of channel networks in salt marshes. *Limnol. Oceanogr.* 9999, 2021, 1–13 doi: 10.1002/lno.11977
133. Lu, S., Jin, J., Zhou, J., Li, X., Ju, J., Li, M., Chen, F., Zhu, L., Zhao, H., Yan, Q., Xie, C., and S. Fagherazzi 2021. Drainage basin reorganization and endorheic-exorheic transition triggered by climate change and human intervention. *Global and Planetary Change*, 201, p.103494.
132. Liu, Z. \*, Fagherazzi, S. and Cui, B., 2021. Success of coastal wetlands restoration is driven by sediment availability. *Communications Earth & Environment*, 2(1), pp.1-9.
131. Fagherazzi S., Baticci L. \*, Brandon C.M. \*, Rulli M.C. 2021. Bedrock erosion in subglacial channels. *PLoS ONE* 16(9): e0253768. <https://doi.org/10.1371/journal.pone.0253768>
130. Jin, S. \*, Liu, Y., Fagherazzi, S., Mi, H. \*, Qiao, G., Xu, W., Sun, C., Liu, Y., Zhao, B. and Fichot, C.G., 2021. River body extraction from sentinel-2A/B MSI images based on an adaptive multi-scale region growth method. *Remote Sensing of Environment*, 255, p.112297.
129. Al Abri, A. \*, Snyder, N.P. and Fagherazzi, S., 2021. Vegetation and cloud cover shape semi-arid carbonate landform development. *Earth Surface Processes and Landforms*.
128. Liu, Z. \*, Fagherazzi, S., Li, J. and Cui, B., 2021. Mismatch between watershed effects and local efforts constrains the success of coastal salt marsh vegetation restoration. *Journal of Cleaner Production*, p.126103.
127. Nardin, W. \*, Vona, I. and Fagherazzi, S., 2021. Sediment deposition affects mangrove forests in the Mekong delta, Vietnam. *Continental Shelf Research*, 213, 104319.
126. Wang, J. \*, Dai, Z., Mei, X. and Fagherazzi, S., 2020. Tropical Cyclones Significantly Alleviate Mega-Deltaic Erosion Induced by High Riverine Flow. *Geophysical Research Letters*, 47(19), p.e2020GL089065.
125. Donatelli, C. \*, Kalra, T.S., Fagherazzi, S., Zhang, X. \* and Leonardi, N., 2020. Dynamics of marsh-derived sediments in lagoon-type estuaries. *Journal of Geophysical Research: Earth Surface*, p.e2020JF005751.
124. Zhang, W. \*, Zhang, X. \*, Huang, H., Wang, Y. and Fagherazzi, S., 2020. On the morphology of radial sand ridges. *Earth Surface Processes and Landforms*, 45(11), pp.2613-2630.
123. Liu, Z. \*, Fagherazzi, S., She, X., Ma, X., Xie, C. and Cui, B., 2020. Efficient tidal channel networks alleviate the drought-induced die-off of salt marshes: Implications for coastal restoration and management. *Science of The Total Environment*, 749, p.141493.

122. Liu, Z.\*, Fagherazzi, S., Ma, X., Xie, C., Li, J. and Cui, B., 2020. Consumer control and abiotic stresses constrain coastal saltmarsh restoration. *Journal of Environmental Management*, 274, p.111110.
121. Mi, H.\*, Fichot, C.G., Bryan, K.R., Qiao, G. and Fagherazzi, S., 2020. Rapid shoreline flooding enhances water turbidity by sediment resuspension: an example in a large Tibetan lake. *Earth Surface Processes and Landforms*. DOI: 10.1002/esp.5000
120. Fagherazzi, S., Mariotti, G., Leonardi, N., Canestrelli, A., Nardin, W., & Kearney, W. S. (2020). Salt marsh dynamics in a period of accelerated sea level rise. *Journal of Geophysical Research: Earth Surface*, 125, e2019JF005200. <https://doi.org/10.1029/2019JF005200>
119. Zhang, X.\*, Leonardi, N., Donatelli, C. and Fagherazzi, S., 2020. Divergence of sediment fluxes triggered by sea-level rise will reshape coastal bays. *Geophysical Research Letters*, 47(13), p.e2020GL087862.
118. Donatelli, C.\*, Zhang, X.\*, Ganju, N.K., Aretxabaleta, A.L., Fagherazzi, S. and Leonardi, N., 2020. A nonlinear relationship between marsh size and sediment trapping capacity compromises salt marshes' stability. *Geology*. <https://doi.org/10.1130/G47131.1>
117. Ganju, N.K., Defne, Z. and Fagherazzi, S., 2020. Are Elevation and Open-Water Conversion of Salt Marshes Connected?. *Geophysical Research Letters*, 47(3), p.e2019GL086703.
116. Zhang\*, X., Fichot, C.G., Baracco, C., Guo, R., Neugebauer, S., Bengtsson, Z., Ganju, N. and Fagherazzi, S., 2020. Determining the drivers of suspended sediment dynamics in tidal marsh-influenced estuaries using high-resolution ocean color remote sensing. *Remote Sensing of Environment*, 240, p.111682.
115. Lyu, Y.\*, Fagherazzi, S., Zheng, S., Tan, G. and Shu, C., 2020. Enhanced hysteresis of suspended sediment transport in response to upstream damming: An example of the middle Yangtze River downstream of the Three Gorges Dam. *Earth Surface Processes and Landforms*.
114. Lyu, Y.\*, Fagherazzi, S., Tan, G., Zheng, S., Feng, Z., Han, S. and Shu, C., 2020. Hydrodynamic and geomorphic adjustments of channel bars in the Yichang-Chenglingji Reach of the Middle Yangtze River in response to the Three Gorges Dam operation. *CATENA*, 193, p.104628.
113. Wiberg, P.L., Fagherazzi, S. and Kirwan, M.L., 2020. Improving predictions of salt marsh evolution through better integration of data and models. *Annual review of marine science*, 12, pp.389-413.
112. Palazzoli, I.\*, Leonardi\*, N., Jiménez-Robles\*, A.M. and Fagherazzi, S., 2020. Velocity skew controls the flushing of a tracer in a system of shallow bays with multiple inlets. *Continental Shelf Research*, 192, p.104008.

111. Fagherazzi, S.\*; Nordio, G.\*; Munz, K.\*; Catucci, D.\*; Kearney, W.\* 2019. Variations in Persistence and Regenerative Zones in Coastal Forests Triggered by Sea Level Rise and Storms. *Remote Sens.* 11(17); <https://doi.org/10.3390/rs11172019>.
110. Mi H.\*, Fagherazzi S., Qiao G., Hong Y., Fichot C.G. 2019. Climate change leads to a doubling of turbidity in a rapidly expanding Tibetan lake. *Science of The Total Environment*, 688, pp. 952-959
109. Donatelli, C., Ganju, N.K., Kalra, T.S., Fagherazzi, S. and Leonardi, N., 2019. Changes in hydrodynamics and wave energy as a result of seagrass decline along the shoreline of a microtidal back-barrier estuary. *Advances in Water Resources*, 128, pp.183-192.
108. Kearney W.S., Fernandes A., Fagherazzi S. 2019. Sea-level rise and storm surges structure coastal forests into persistence and regeneration niches. *PLoS ONE* 14(5): e0215977. <https://doi.org/10.1371/journal.pone.0215977>
107. Mariotti, G., Kearney, W. and Fagherazzi, S., 2019. Soil creep in a mesotidal salt marsh channel bank: Fast, seasonal, and water table mediated. *Geomorphology* 33 126-137 <https://doi.org/10.1016/j.geomorph.2019.03.001>
106. Fagherazzi S., S.C. Anisfeld, L.K. Blum, E.V. Long, R.A. Feagin, A. Fernandes\*, W.S. Kearney\*, K. Williams 2019. Sea level rise and the dynamics of the marsh-upland boundary, *Frontiers in Environmental Science*.
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### **News, Forum, Perspectives and Comments**

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### **In the News**

Il clima della Russia influisce su S.Marco, Italian Newspaper Gazzettino, Page II, Thursday 10/13/2005.

The big picture of marsh loss (News and Views article in *Nature* by Steve Pennings) 2012

Why are our salt marshes falling apart? (Press release by the Marine Biological Laboratory; re-posted on many sites) 2012

Why are coastal salt marshes falling apart? (Press release by the National Science Foundation; re-posted on many sites) 2012

Research shows negative impact of nutrients on coastal ecosystems (Louisiana State U. press release re-posted on many sites) 2012

Fertilizer harming Plum Island salt marsh, study finds (Boston Globe, 18 October 2012)

Scientists solve mystery of disappearing marshes (NPR story on Morning Edition, 18 October 2012)

Nutrient runoff turns useful salt marshes into useless mudflats, long-term study finds [Nashua (NH) Telegraph, 18 October 2012]

Scientists: Fertilizers are killing salt marshes [Newburyport (MA) Daily News, 19 October 2012]

Local study spotlights decay of salt marshes [Gloucester (MA) Times, 22 October 2012]

Mother Earth's 'kidneys' are failing (Cape Cod Times, 23 October 2012)

Marsh basin Dynamics (Editor's choice Science 340 5 April 2013)

Normal Weather Drives Salt Marsh Erosion (USGS Newsroom, BU research, Coastalcare, NZ HealthTec, Morning News Headline, Online News Planet, follownews, Prime Tim eReports, NewsUnited, Whoisin the news, Sci24h, Scifeeds, WN January 2016)

Salt marshes will persist despite rising seas, study predicts. Traditional assessment methods overestimate vulnerability, say researchers (Science Daily, March 2016)

Salt marshes resilient to sea level rise (Daily Press, March 2016)

Salt marshes can outgrow sea-level rise (Marine Science Today, March 2016)

Salt Marshes Resilient Against Sea Level Rise (Oceanbites, March 2016)

Study predicts salt marshes will persist despite rising seas (SciFeeds, March 2016)

New study shows rapid marsh bank sediment build up does not equate land loss resilience (LSU Media Center, Sciencedaily May 2016)

NASA Landsat Science News: Apalachicola Disappearing Swamp (December 2016)

New technique quickly predicts salt marsh vulnerability, Science Eurekalert! (24 Jan 2017)

Impact of Hurricanes and Nor'easters on Coastal Forests, EOS Research Spotlight (April 2018)

The emerald review: The Disappearance of Tidal Marshes Caused by Sea-Level Rise – Featuring Sergio Fagherazzi December 7 2022 <https://emeraldreview.com/2022/12/the-disappearance-of-tidal-marshes-caused-by-sea-level-rise-featuring-sergio-fagherazzi/>

## **Book Chapters**

1. S. Fagherazzi, D.M. FitzGerald, R.W. Fulweiler, Z. Hughes, P.L. Wiberg, K.J. McGlathery, J.T. Morris, T.J. Tolhurst, L.A. Deegan, D.S. Johnson, J.S. Lesser, J.A. Nelson, *Ecogeomorphology of Salt Marshes*, Reference Module in Earth Systems and Environmental Sciences, Elsevier, 2021, ISBN 9780124095489, <https://doi.org/10.1016/B978-0-12-818234-5.00194-2>.
2. Fagherazzi S., N. Leonardi, L. Carniello. A. Canestrelli. A. D'Alpaos, W. Nardin 2021. *Modelling Tidal Environments*, Reference Module in Earth Systems and Environmental Sciences. ISBN: 9780124095489; DOI: 10.1016/B978-0-12-818234-5.00097-3
3. Fagherazzi S., W. Kearney, G. Mariotti, N. Leonardi and W. Nardin (2021). *Understanding Marsh Dynamics: Modelling approaches*, in FitzGerald D.M. Hughes Z. (eds.) *Salt Marshes: Function, Dynamics, and Stresses*, 278-300, Cambridge University Press, ISBN-13: 978-1107186286.
4. Mudd S.M., S. Fagherazzi (2016), Chapter 12 *Salt Marsh Ecosystems: Tidal Flow, Vegetation, and Carbon Dynamics*. In: E.A. Johnson, Y.E. Martin (eds.) *A Biogeoscience Approach to Ecosystems*, 201, Cambridge University Press, pp. 407-430 ISBN: 9781107046702
5. Fagherazzi S., FitzGerald D.M., Fulweiler R.W., Hughes Z., Wiberg P.L., McGlathery K.J., Morris J.T., Tolhurst T.J., Deegan L.A., and Johnson D.S. (2013) *Ecogeomorphology of Tidal Flats*. In: John F. Shroder (ed.) *Treatise on Geomorphology*, Volume 12, pp. 201-220. San Diego: Academic Press.
6. Fagherazzi S., FitzGerald D.M., Fulweiler R.W., Hughes Z., Wiberg P.L., McGlathery K.J., Morris J.T., Tolhurst T.J., Deegan L.A., and Johnson D.S. (2013) *Ecogeomorphology of Salt Marshes*. In: John F. Shroder (ed.) *Treatise on Geomorphology*, Volume 12, pp. 182-200. San Diego: Academic Press.
7. Fagherazzi S, Marani M., and Blum L.K., *Introduction: The coupled evolution of geomorphological and ecosystem structures in salt marshes*, in Fagherazzi S, Marani M., and Blum L.K., (Eds.) *The Ecogeomorphology of Salt Marshes*, Estuarine and Coastal Studies Series, American Geophysical Union, Washington D.C., pp. 1-5, 2004.
8. Mudd S.M., Fagherazzi S., Morris J.T., and Furbish D.J., *Flow, sedimentation, and biomass production on a vegetated salt marsh in South Carolina: toward a predictive model of marsh morphologic and ecologic evolution*, in Fagherazzi S, Marani M., and Blum L.K., (Eds.) *The Ecogeomorphology of Salt Marshes*, Estuarine and Coastal Studies Series, American Geophysical Union, Washington D.C., pp. 165-187, 2004.
9. Fagherazzi S., Lanzoni S., Marani M, e Rinaldo A., *Reti a marea*, *Atti dell' Istituto Veneto di Scienze Lettere ed Arti*, Tomo CLVII, p 161-230, (*in Italian*) 1998-1999.

### **Proceedings (Refereed)**

1. Canestrelli A.\*, Fagherazzi S., Defina A. and Lanzoni S., *Erosional power and morphodynamic tendencies in the Fly River Delta, Papua New Guinea*. Proceedings of the 8th Conference on River, Coastal and Estuarine Morphodynamics, RCEM 2009

2. Fagherazzi S., Carniello L.\*, Defina A., D'Alpaos L., Wind waves in shallow microtidal basins and the transition from tidal flats to salt marshes, IAHR, Venice, July 1-6 2007
3. Carniello L.\*, D'Alpaos L., Defina A., Fagherazzi S., A conceptual model for the long term evolution of tidal flats in the Venice lagoon, 8 pp., 5th IAHR Symposium on river, coastal and estuarine morphodynamics, Enschede, The Netherlands, 17-21 September 2007.
4. D'Alpaos A.\*, S. Fagherazzi, & S. Lanzoni, On the cross-sectional evolution of tidal channels, Proceedings of the 4th Conference on River, Coastal and Estuarine Morphodynamics, RCEM 2005 - Parker & Garcia (eds), Taylor and Francis Group, London, pp 617-628. 2006

## Datasets

1. Nordio G., S. Fagherazzi. 2022 Groundwater, soil moisture, light and weather data collected in a coastal forest bordering a salt marsh in the Delmarva Peninsula (VA) Data in Brief, p.108584.
2. Donatelli, C., Ganju, N.K., Kalra, T.S., Fagherazzi, S. and Leonardi, N., 2019. Dataset of numerical modelling results of wave thrust on salt marsh boundaries with different seagrass coverages in a shallow back-barrier estuary. Data in Brief, p.104197.

## Proceedings (Non Refereed)

1. Fagherazzi S., L. Cortese\* Feeding Salt Marshes with Coastal Storms *Coastal Sediments 2023*, New Orleans. The Proceedings of the Coastal Sediments 2023, 2507-2512
2. Nardin W.\*, D. A. Edmonds, S. Fagherazzi Freshwater vegetation influence on sediment spatial distribution in river delta during flood *Coastal Sediments 2015*, May 11-15 San Diego, California, 11 pp., 2015
3. Nienhuis N.H., A.D. Ashton A.D., L. Giosan, W. Nardin\*, S. Fagherazzi, Breaking-wave-driven sediment bypassing of river mouths: mechanisms and effects on delta evolution, *Coastal Sediments 2015*, May 11-15 San Diego, California, 11 pp., 2015
4. Fagherazzi S. Mariotti G.; Sun T., Morphodynamics and Sedimentology of Channels in Tidal Bars and Tidal Flats AAPG-ICE, Milan 23-26 October 2011 7pp (extended abstract)
5. Masetti R.\*, Fagherazzi S., and Montanari A., Analisi numerica del processo di evoluzione di un'isola di barriera in ambiente marino (in Italian), *XXX° Convegno di Idraulica e Costruzioni Idrauliche - IDRA 2006*, ROMA 10-15 SETTEMBRE 2006 (13pp. in Italian)
6. Fagherazzi S., Wiberg P.L., and Howard A.D., Modeling barrier island formation and evolution, *Coastal Sediments 2003*, May 18-23 Clearwater Beach, Florida, 9 pp., 2003



7. D'Odorico P., Fagherazzi S., e Rigon R., Frane superficiali e idrologia dei versanti: un possibile metodo di indagine, *Atti del 28 Convegno di Idraulica e Costruzioni Idrauliche*, 8pp (In Italian) Potenza 16-19 settembre 2002

### **Keynote Presentations**

From the mud the lotus springs. International cohesive sediment dynamics meetings INTERCOH 2017, Montevideo, Uruguay, from November 13-17, 2017

Nonlinear dynamics and alternative stable states in salt marshes and mangroves. Workshop on biogeomorphology and pattern formation on estuaries and coastal ecosystems State Key Laboratory of Estuarine East China Normal University, Shanghai June 2016

Una, Dieci, Cento Lagune, Cerimonia di conferimento del Premio Augusto Ghetti, Istituto Veneto di Scienze, Lettere e Arti October 9 2014

The Tide Rises, the Tide Falls: Morphodynamics of Lagoons, Gilbert Club 2012, UC Berkeley Saturday, December 8, 2012

Geomorphology of tidal freshwater wetlands: conceptual basis and ecological implications. AGU Chapman Conference Hydrogeomorphic Feedbacks and Sea Level Rise in Tidal Freshwater River Ecosystems, Reston Virginia USA 13-16 November 2012

An Interdisciplinary Framework for Coastal Processes: Risk, Management and Protection, NSF Workshop: Process-Driven Risk Assessment and Sustainable Mitigation Strategies Vanderbilt University, Nashville, Tennessee, September 11-14, 2005.

### **Invited Colloquia**

Monitoring Coastal Wetlands Using Remote Sensing Data: the NASA Delta-X project, University of Buffalo, February 2022

Marsh Collapse Does Not Require Sea Level Rise, Horn Point Laboratory, University of Maryland, October 2020

Buried alive or washed away: the challenging life of mangroves in the Mekong delta, Biogeosciences program, Department of Earth and Environment, Boston University, March 2019

Buried alive or washed away: the challenging life of mangroves in the Mekong delta. College of Surveying and Geo-Informatics, Tongji University China, October 2018

Non-Linear dynamics determine the long-term fate of salt marshes. Ocean Engineering Department, University of New Hampshire, Feb. 9 2018

Salt marsh collapse: no sea level rise required. In Dimensions of Sustainability symposium: Salt Marshes Under Stress: Current Trends, Future Scenarios, University of Massachusetts Boston Friday Dec. 8 2017

Gradients in water surface drive coastal ecosystems and determine the resilience of shorelines against extreme events, Jet Propulsion Laboratory, Pasadena, April 2016

Intertidal Morphodynamics in a Changing World, Department of Coastal and Civil Engineering, University of Florida, March 2016

Marsh Collapse Does Not Require Sea Level Rise, Department of Civil Engineering, Massachusetts Institute of Technology, October 2015

Marsh Collapse Does Not Require Sea Level Rise, Department of Marine and Coastal Science, Rutgers University, May 2015

The tide Rises the Tide Falls: Geomorphology of Intertidal Areas, Earth Observatory of Singapore, Nanyang Technological University, November 2014

Marsh Collapse Does Not Require Sea Level Rise, Earth Observatory of Singapore, Nanyang Technological University, November 2014

Marsh Collapse does not require Sea Level Rise, Coastal & Ocean Fluid Dynamics Laboratory, Woods Hole Oceanographic Institution, May 2014

Marsh Collapse does not require Sea Level Rise, Department of Environmental Science and Engineering, California Institute of Technology, January 2014

Nonlinear dynamics and alternative stable states in shallow bays, department of Geological Sciences, Indiana University, November 2013

The Tide Rises, the Tide Falls: Morphodynamics of Lagoons, Nicholas School of the Environment, Duke University February 2013

The Tide Rises, the Tide Falls: Morphodynamics of Lagoons, Department of Geological Sciences, U North Carolina February 2013

The Tide Rises, the Tide Falls: Morphodynamics of Lagoons, Department of Geography, UC Berkeley January 2013

The coupled morphological and biological evolution of intertidal landscapes, Department of Geosciences, Marine Biological Laboratory, February 2012

The Fly River and related coastal system, Papua New Guinea, Department IMAGE University of Padua, Italy, May 2011

The coupled morphological and biological evolution of intertidal landscapes, Department of Geosciences, University of Massachusetts Amherst, November 2010

The morphological evolution of intertidal landscapes, Department of Civil and Coastal Engineering, University of Florida, October 2010

Erosion of Salt Marsh Boundaries, Department of Earth Sciences, University of New Hampshire, October 2010

Morphodynamics of tidal channels in muddy coastlines, Department IMAGE University of Padua, Italy, May 2010

The coupled morphological and biological evolution of intertidal landscapes, Department of Civil and Environmental Engineering, Louisiana State University, April 2010

Geomorphic Structure of Tidal Hydrodynamics in Salt Marsh Creeks, Coastal & Ocean Fluid Dynamics Laboratory, Woods Hole Oceanographic Institution, June 2009

Drivers and disturbance on coastal landscapes Department of Earth Sciences, Boston University, April 2009

Self-organization of shallow basins in tidal flats and salt marshes, Department of Earth Science, University of California, Santa Barbara April 2009

Coastal Ecogeomorphology Department of Earth Science, University of California, Santa Barbara April 2009

The ecogeomorphology of salt marshes, Department of Biology, Boston University, January 2009

Controls on fluvial incision of continental shelves, Geology & Geophysics, Woods Hole Oceanographic Institution, August 2008

Long-Term Environmental Change at the Virginia Coast Reserve, Department of Environmental Sciences, Parma University, Italy June 2008

Long-Term Environmental Change at the Virginia Coast Reserve, ISMAR-CNR, Venice, Italy, June 2008

Long-Term Environmental Change at the Virginia Coast Reserve, Department IMAGE, University of Padua, Italy, June 2008

Physical and biological drivers of intertidal morphodynamics, Department of Earth and Environmental Science, University of Pennsylvania, April 2008

Self-organization of shallow basins in tidal flats and salt marshes, Ralph M. Parsons Laboratory, Massachusetts Institute of Technology, September 2007

Critical bifurcation of shallow intertidal landscapes in tidal flats and salt marshes, Coastal & Ocean Fluid Dynamics Laboratory, Woods Hole Oceanographic Institution, August 2007

Models of Deltaic and Inner Continental Shelf Landform Evolution, Center for Computational Science, Boston University, March 2007

Critical bifurcation of shallow intertidal landscapes in tidal flats and salt marshes, St. Anthony Falls Laboratory, University of Minnesota, September 2006

Physical and biological Drivers of intertidal morphodynamics, Department of Environmental Sciences, University of Virginia, April 2006

Critical bifurcation of coastal landscapes in tidal flats and salt marshes, Department of geology, University of South Florida, March 2006

Critical bifurcation of coastal landforms in tidal flats and salt marshes, Department of Earth Sciences, Boston University, February 2006

Coupling fluvial incision and coastal processes on continental shelves during sea-level cycles, Department of Earth Sciences, Boston University, February 2006

Critical bifurcation of coastal landscapes in tidal flats and salt marshes, Earth and Ocean Sciences Division Nicholas School, Duke University, February 2006

Physical and Biological Effects on Tidal Channels Morphodynamics, Department of Geological Sciences, Florida State University, February 2005

Physical and Biological Effects on Tidal Channels Morphodynamics, Department of Civil and Environmental Engineering, University of California, Berkeley, February 2005

Geomorphological and Ecological Models for Salt Marsh Evolution Department of Geology, University of Florida, September 2004

Tidal flow field in a small basin Geophysical Fluid Dynamics Institute, Florida State University FL, September 2004

Tidal flow field in a small basin, Dipartimento di Ingegneria Ambientale, Genoa University, Italy, 2003.

An implicit finite-difference method for predicting fluvial erosion of continental shelves during sea level low stands Department of Civil and Environmental Engineering, University of Connecticut, CT, 2003.

Physical Processes in Salt Marshes, Department of Physical Sciences, Virginia Institute of Marine Sciences, Gloucester Point, VA, 2002.

Modeling Fluvial Erosion of Continental Shelves Dipartimento di Ingegneria Idraulica, Ambientale, Infrastrutture viarie, e Rilevamento, Politecnico di Milano, Italy, 2002.

Modeling Fluvial Erosion of Continental Shelves, Department of Geology, University of Delaware, Newark, DE, 2002.

Modeling Fluvial Erosion of Continental Shelves, Department of Geological Sciences, Florida State University, Tallahassee, FL, 2001.

Geomorphology of Salt Marshes Department of Oceanography, Florida State University FL, February 2004

Geomorphology of Salt Marshes Department of Environmental Sciences, University of Virginia, Charlottesville, VA, 2001.

Geomorphology of Salt Marshes Department of Geological Sciences, University of South Carolina, Columbia, SC, 2000.

Geomorphology of Salt Marshes Department of Plants, Soils, and Biometeorology, Utah State University, Logan, UT, 2000.

Geomorphology of Salt Marshes Dipartimento di Ingegneria Civile e Ambientale, Universita' degli studi Di Trento, Italy, 2000.

Geomorphology of Salt Marshes Department of Geological Sciences, Florida State University, Tallahassee, FL, 2000.

Tidal Networks Department of Civil and Environmental Engineering, University of California, Davis, CA, 1998.

Tidal Networks Department of Geology and Geophysics, University of California, Berkeley, CA, 1998.

## Invited Conference Presentations

Fagherazzi S., X. Zhang, C. Jones, T. Oliver-Cabrera, M. Simard. Using Rapid Repeat SAR Interferometry to improve Hydrodynamic Models of flood propagation in Coastal Wetlands EGU General Assembly Conference Abstracts, EGU21-12609 2021 (invited)

Michael H.A., J. Guimond, Y.P.Y. Chin, S. Fagherazzi, K. Gedan, M.L. Kirwan. Drivers and impacts of marsh migration in the coastal critical zone. AGU Fall Meeting 2021 (invited)

M Simard, C. Jones, M.W. Denbina, D. Jensen, T. Oliver-Cabrera, A. Christensen, E. Castaneda, A. Rovai, R. Twilley, P. Passalacqua, K.A. Wright, M.P. Lamb, T. Pavelsky, S. Fagherazzi, C.G. Fichot, E. Rodriguez, L. Giosan, D.R. Thompson, Delta-X: Resolving Hydrological and Ecological Processes in the Mississippi River Delta AGU Fall Meeting 2021 (invited)

Fagherazzi S., Mariotti G., Leonardi N., Nardin W., Kearney W., Morphodynamics and modelling of salt marshes in a period of accelerated sea level rise (invited). American Geophysical Union Fall Meeting 2020

Fagherazzi S., C. Donatelli, N.K. Ganju, N. Leonardi. Seagrass impact on sediment exchange between tidal flats and salt marsh and the sediment budget of shallow bays (invited) American Geophysical Union, Transactions, Fall Meeting, 2018

Fagherazzi S., W.S. Kearney, A.M. Jiménez-Robles, C. Hopkinson, K.A. Castagno, N.K. Ganju. Assessing salt marsh resilience with sediment fluxes: the critical role of marine sediment inputs (invited) American Geophysical Union, Transactions, Fall Meeting, 2018

Fagherazzi S., La Cecilia D.\*, Toffolon M., Woodcock C.E. Interactions between river stage and wetland vegetation detected with a Seasonality Index derived from LANDSAT images in the Apalachicola delta, Florida (Invited) American Geophysical Union, Transactions, Fall Meeting, 2016

Fagherazzi S., Yao H.\*, Leonardi N.\*, Li J. Sediment transport in a surface-advected estuarine plume (Invited) American Geophysical Union, Transactions, Fall Meeting, 2016

Mariotti G, Fagherazzi S. Salt marsh loss: drowning or retreat. GSA Annual Meeting in Vancouver, British Columbia 19–22 October 2014

Fagherazzi S. Marsh Collapse does not require sea level rise, 2nd Biennial Conference of the Coastal and Estuarine Research Federation 3-7 November San Diego, 2013

Moore L.J., Duran Vincent O., Walters D., Fagherazzi S., Mariotti G., Young D., Wolner C.V., Biological-Physical Feedbacks Determine Coastal Environmental Response to Climate Change (Invited), American Geophysical Union, Transactions, Fall Meeting, 2012

Fagherazzi, S., Self-organization of tidal deltas (Invited), American Geophysical Union, Transactions, Fall Meeting, 2011

Perron T, Fagherazzi S, The legacy of initial conditions in evolving landscapes, American Geophysical Union, Transactions, Fall Meeting, 2009

Fagherazzi S. Coastal System, Papua New Guinea, NSF-MARGINS Integration and Synthesis of S2S Research, Gisborne, New Zealand, April 5 - 9, 2009

Fagherazzi S., Masetti R.\*, Montanari A., A Process Based Numerical Model for the Evolution of a Barrier Island in a Wave Dominated Shelf (Invited) American Geophysical Union, Transactions, Fall Meeting, 2006

Fagherazzi S., Carniello L.\*, D'Alpaos L., Defina A., Critical Bifurcation of Shallow Microtidal Landforms in Tidal Flats and Salt Marshes, (Invited) American Geophysical Union, Transactions, Fall Meeting, 2006

Fagherazzi S., Howard A.D., Wiberg P.L., Coupling fluvial incision, delta deposition, and coastal processes on continental shelves during sea-level cycles, (Invited) American Geophysical Union, Transactions, Fall Meeting, 2005

D'Odorico P., and Fagherazzi S., Landslide Frequency in Colluvial Deposits: Hollow Infilling Time Scale and Frequency of Triggering Rainfalls, American Geophysical Union, Transactions, Spring Meeting, (*invited, Surface Water Hydrology and Water Resources Posters*), 2002.

Furbish D.J. and Fagherazzi S., the stability of creeping soil, American Geophysical Union, Transactions, Fall Meeting, (*invited, Fans, Flows, and Glaciers: A Special Session in Honor of Roger L. B. Hooke*), 1999.

## **Conference Presentations and Posters**

Fagherazzi S., G. Nordio, D. Pratt, and H.A. Michael Initial soil moisture and soil texture control the impact of storm surges in coastal forests. AGU Fall Meeting 2023.

Xie D., Z.J. Hughes, D. FitzGerald, S. Tas, T.Z. Asik and S. Fagherazzi, Implications of Causeway Removal on Longshore Sediment Transport During Storms in a Complex Shoreline System. AGU Fall Meeting 2023.

Cortese L., C. Donatelli, X. Zhang, J. Nghiem, M. Simard, C. Jones, M.W. Denbina, C.G. Fichot, J.P. Harringmeyer and S. Fagherazzi, Coupling numerical models of deltaic wetlands with AirSWOT, UAVSAR, and AVIRIS-NG remote sensing data. AGU Fall Meeting 2023.

Simard M., P. Matte, A. Christensen, R. Savelli, C. Jones, S. Fagherazzi and P. Passalacqua, Observing and modeling the hydrodynamic factors controlling the fate of river deltas: from Delta-X to SWOT, NISAR and STV missions. AGU Fall Meeting 2023.

Saoussen Belhadj-Aissa, A Parra, A. Christensen, M. Simard and S. Fagherazzi, Using Sentinel-1 Backscatter Time Series to Estimate the Hydroperiod of Virginia's Coastal Wetlands. AGU Fall Meeting 2023.

Parra A.S., S Belhadj-Aissa, A. Christensen, S. Fagherazzi and M. Simard, Spaceborne LiDAR for Monitoring Coastal Wetlands Hydrological Conditions. AGU Fall Meeting 2023.

Xu Y, Fagherazzi S. Shaping of the Future Salt Marshes through Self Organization and Their Vulnerability driven by Sediment Spatial Heterogeneity. AGU Fall Meeting 2023.

Xu Y, C Franks, S Fagherazzi Longterm Coastal Salt Marsh Changes Across US East Coast Synthesized Through Geometric Emphasized Machine Learning. AGU Fall Meeting 2023.

Soloy A, A Christensen, MW Denbina, D Jensen, T Oliver-Cabrera, et al. The influence of seasonal variations in river flow on tidal propagation and water circulation in the Mississippi Delta. AGU Fall Meeting 2023

Smith AJ, K Valentine, J Small, A Khan, K Gedan, G Nordio, S Fagherazzi, et al. Litter decomposition in retreating coastal forests. AGU Fall Meeting 2023

Fagherazzi S., C. Fichot, M. Friedl, M. Simard. Coupling remote sensing imagery and numerical models to quantify the resilience of coastal marshes to climate change, NASA CCE Joint Science Workshop, Washington DC, Maryland May 8-11 2023.

Cortese, L., X Zhang, M Simard, S Fagherazzi. Quantifying the impact of storm surges on mineral accretion rates of coastal marshes EGU General Assembly Conference Abstracts, EGU23-4280 2023

Gourgue O., Y. Xu, J.P. Belliard, J. van Belzen, J. van de Koppel, M.G. Kleinans, S. Fagherazzi, S. Temmerman Contrasting saltmarsh vegetation impacts under increasing sea level rise rates. EGU General Assembly Conference Abstracts, EGU23-16448 2023

Michael H., S. Fagherazzi al. Marsh migration in the coastal critical zone: Drivers and impacts of hydrological, biogeochemical, and ecological change. EGU General Assembly Conference Abstracts, EGU23-11150 2023

Pratt D., G. Nordio\*, S. Fagherazzi, H.A. Michael The Fast and Slow Hydrological Drivers of Marsh Migration along the Delmarva Peninsula. American Geophysical Union. Fall Meeting 2022

Xu Y.\*, S. Fagherazzi Predictability of Salt Marshes in Coastal Land Reclamation. American Geophysical Union Fall Meeting 2022.

Cortese, L.\*, Jensen, D. J., Simard ,M., & Fagherazzi, S. (2022). Using NDVI Timeseries to Infer Soil Vertical Accretion Contribution from Marsh Vegetation. Abstract EP25A-08 presented at AGU 2022 Fall Meeting, 12-16 Dec.

Fagherazzi S. X. Zhang\*, C. Jones, M. Simard, Coupling remote sensing imagery and numerical models to quantify the resilience of coastal marshes to climate change. 37th International Conference on Coastal Engineering, ICCE 2022, 4-9 December, Sydney Australia

Nordio G.\*, K Gedan, S Fagherazzi. Hydrological variable clustering and ecological patterns in a coastal forest. American Geophysical Union Fall Meeting 2022

Gourgue O. \*, J.P. Belliard, Y. Xu\*, S. Fagherazzi, and S. Temmerman. Vegetation hinders sediment transport towards saltmarsh interior. EGU General Assembly Conference Abstracts, EGU21-10906 2022

Fagherazzi S., X. Zhang\*, C. Jones, T. Oliver-Cabrera, M. Simard. Using Rapid Repeat SAR Interferometry to improve Hydrodynamic Models of flood propagation in Coastal Wetlands EGU General Assembly Conference Abstracts, EGU21-12609 2021 (invited)

Zhang X. \*, K.A. Wright, P. Passalacqua, M. Simard and S. Fagherazzi Improving channel hydrological connectivity in coastal hydrodynamic models with remote-sensed channel networks. AGU Fall Meeting 2021

M Simard, C. Jones, M.W. Denbina, D. Jensen, T. Oliver-Cabrera, A. Christensen, E. Castaneda, A. Rovai, R. Twilley, P. Passalacqua, K.A. Wright, M.P. Lamb, T. Pavelsky, S. Fagherazzi, C.G. Fichot, E. Rodriguez, L. Giosan, D.R. Thompson, Delta-X: Resolving Hydrological and Ecological Processes in the Mississippi River Delta AGU Fall Meeting 2021 (invited)

Gourgue O. \*, JP. Belliard, S. Fagherazzi and S. Temmerman Salt Marsh Resilience Inherited from Self-Organization of Tidal Channel Networks at Plant Colonization Stage AGU Fall Meeting 2021

Xu Y. \*, T.S. Kalra, N.K. Ganju, and S. Fagherazzi, Modeling the Dynamics of Salt Marsh Formation. AGU Fall Meeting 2021

Nordio G. \*, S. Fagherazzi Impacts of a Medium Intensity Storm Surge Event on Groundwater Level and Conductivity along the North Atlantic Coast. AGU Fall Meeting 2021

Cortese L. \*, S. Fagherazzi Fetch and distance from the bay control accretion and erosion patterns in Terrebonne marshes (Louisiana, USA). AGU Fall Meeting 2021

Michael H.A., J. Guimond, Y.P.Y. Chin, S. Fagherazzi, K. Gedan, M.L. Kirwan. Drivers and impacts of marsh migration in the coastal critical zone. AGU Fall Meeting 2021 (invited)

Fichot C.G., S. Jin\*, S. Fagherazzi, S.E. Lohrenz, Y. Liu. Recent decline in wind-driven wave energy decreases nearshore sediment availability to Louisiana salt marshes. AGU Fall Meeting 2021



Fagherazzi S., X. Zhang\*, P. Passalacqua, C. Jones, M. Simard Vegetation promotes water retention in deltaic wetlands AGU Fall Meeting 2021

Gourgue O.\*, J. van Belzen, W. Vandenbruwaene, C. Schwarz, J. Vanlede, J.P. Belliard, S. Fagherazzi, T. Bouma, J. van de Koppel, S. Temmerman Design of climate-resilient marsh restoration projects using a novel multiscale biogeomorphic model. American Geophysical Union Fall Meeting, 2020

Zhang X.\*, Donatelli C\*, Leonardi N, Fagherazzi S Divergence of Sediment Fluxes Triggered by Sea-Level Rise Will Reshape Coastal Bays American Geophysical Union Fall Meeting, 2020

Nordio G\*, Fagherazzi S Analysis of Temporal Trends of Groundwater Level and Salinity in a Coastal Forested Area in Delmarva Peninsula (VA) American Geophysical Union Fall Meeting, 2020

Alabri A.\*, S. Fagherazzi Relationships between drainage basin morphology, vegetation, and water availability in an arid, carbonate landscape in Oman AGU Fall Meeting 2020

Leonardi N., C. Donatelli\*, X. Zhang\*, N. Ganju, S. Fagherazzi Impact of salt marsh and seagrass beds on the sediment budget and resilience of coastal areas, EGU General Assembly Conference May 2020

Fagherazzi S., Donatelli C., Leonardi N., Ganju N.K. Salt marsh loss affects tides and sediment fluxes in shallow bays. 11th River, Coastal and Estuarine Morphodynamics Symposium RCEM Auckland NZ 16 - 21 November 2019

Mi H.\*, S. Fagherazzi, G. Qiao, Y. Hong and C. G Fichot. Climate Change Leads to A Doubling of Turbidity in A Rapidly Expanding Tibetan Lake American Geophysical Union, Transactions, Fall Meeting, 2019

Zhang X.\*, S. Fagherazzi. The hydrodynamic and meteorological controls on suspended sediment dynamics in a tidal marsh-influenced estuary. The 14th International Symposium on River Sedimentation, Chengdu, China. September 19, 2019. Poster.

Fagherazzi S. Restoring salt marshes with thin layer deposition: a natural experiment in Plum Island Sound, USA, Symposium on Coastal Resources and Environment (CORE2018), October 19-23, Nanjing, China

Mariotti G., S. Fagherazzi, W.S. Kearney\*. Soil creep in a New England salt marsh: fast, seasonal, and likely mediated by vegetation, American Geophysical Union, Transactions, Fall Meeting, 2018

Sun C.\*, S. Fagherazzi Classification mapping of salt marsh vegetation by flexible monthly NDVI time-series using Landsat imagery American Geophysical Union, Transactions, Fall Meeting, 2018

Zhang X.\*, S. Fagherazzi, N. Leonardi, Fate of cohesive sediments in a marsh-dominated estuary American Geophysical Union, Transactions, Fall Meeting, 2018

Kearney W.S.\*, I. Forbrich, S. Fagherazzi, Tidal exchange of heat in salt marshes. 2018 Ocean Sciences Meeting in Portland, Oregon. 11-16 February

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S. Fagherazzi, T. Viggato\*, A.M. Vieillard, R.W Fulweiler, The effect of evaporation and nutrient enrichment on the erodability of mudflats in a mesotidal estuary, American Geophysical Union, Transactions, Fall Meeting, 2014

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Priestas A.M.\* and S. Fagherazzi, Non-uniform Salt Marsh Boundary Erosion by Wave Impact in Coastal Louisiana and Virginia: Implications for Salt Marsh Stability, AGU Chapman Conference on Physics of Wave-Mud Interaction, Amelia Island, Florida, USA 17–20 November 2008

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Fagherazzi S., Tidal flow field in a small basin, SCS Workshop: Applications of Optimal Control and EnKF to Flow Simulation and Modeling, Florida State University, February 23-24, 2005

Carniello L.\*, D'Alpaos L., Defina A., Fagherazzi S., Tidal flat-salt marshes transition in shallow tidal lagoons, *European lagoons and their watersheds: function and biodiversity* Klaipeda, Lithuania, October 4-9, 2005

D'Alpaos A.\*, Fagherazzi S., Lanzoni S., On the cross-sectional evolution of tidal creeks *4th IAHR Symposium on River, Coastal and Estuarine Morphodynamics*, Urbana, Illinois, USA October 4 - 7, 2005

Fagherazzi S., Towards a Coupled Ecological-Morphological Model of Tidal Marsh Evolution. Chapman Conference on Salt Marsh Geomorphology: Physical and Ecological Effects on Landform, Halifax, Nova Scotia, October 9-13, 2004

D'Alpaos A.\*, Fagherazzi S., Lanzoni S., Marani M., and Rinaldo A., Cross Sectional Evolution of Tidal Channels (POSTER) Chapman Conference on Salt Marsh Geomorphology: Physical and Ecological Effects on Landform, Halifax, Nova Scotia, October 9-13, 2004

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Carniello L.\*, Defina A., Fagherazzi S., and D'Alpaos L., A combined wind wave-tidal model for the Venice Lagoon, Italy, American Geophysical Union, Transactions, Fall Meeting, 2004

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Sergio Fagherazzi, Alan D. Howard, and Patricia L. Wiberg, Modeling River Networks in the Continental Shelf during Sea Level Cycles, American Geophysical Union, Transactions, Fall Meeting, 2003.

D'Alpaos A., Fagherazzi S., Marani M., Lanzoni S., Defina A., and Rinaldo A., Channel Initiation and Competition in Tidal Environments, American Geophysical Union, Transactions, Fall Meeting, 2003.

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Alan D. Howard, Sergio Fagherazzi, and Patricia L. Wiberg, Fluvial erosion of continental shelves during sea level low stands, American Geophysical Union, Transactions, Spring Meeting, 2002.

Fagherazzi S., How and where do tides incise channels in a tidal basin? American Geophysical Union, Transactions, Spring Meeting, 2002.

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Fagherazzi S., Furbish D.J., Jobard B., Erlebacher G., Rasetarinera P. and Hussaini M.Y., Application of the Discontinuous Galerkin method to groundwater flow and streamline visualization, American Geophysical Union, Transactions, Fall Meeting, 2000.

Sun T., Fagherazzi S., Parker G. and Furbish J.D., Cyclic Steps: Theory and computer simulations, American Geophysical Union, Transactions, Fall Meeting, 2000.

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## **Contracts and Grants**

29. LTER: Plum Island Ecosystems, the impact of changing landscapes and climate on interconnected coastal ecosystems 10/01/22- 09/30/28 \$396,977 (PI with Cedric Fichot and Wally Fulweiler)

28. Lower Buzzards Bay Sedimentation & Gooseberry Causeway Impact. Buzzards Bay Coalition, Inc 01/01/23- 12/31/24 \$925,024 (CoPI with Zoe Hughes and Duncan Fitzgerald)

27. Coupling remote sensing imagery and numerical models to quantify the resilience of coastal marshes to climate change NASA 01/01/23-12/31/25 \$961,516 (PI with Mark Friedl and Cedric Fichot)
26. Collaborative Research: Network Cluster: The Coastal Critical Zone: Processes that transform landscapes and fluxes between land and sea: NSF-CZN 09/01/20 - 08/30/25 \$247,238 (PI)
25. Long-Term Nonlinear Dynamics of a Coastal Barrier System - VCR LTER VI (CoPI) NSF through U Virginia, 12/01/12 - 11/30/18, \$210,000
24. Delta X (CoPI with Cedric Fichot) NASA 06/01/2019 - 05/31/2022 \$651,896
23. Project 79822 TIGER Marie Sklodowska Curie Global Postdoctoral Fellowship, European Union, 09/01/2019 08/30/2021 \$30,000 (BU portion of the grant)
22. Impact of hurricane Sandy on the salt marshes of Chincoteague Bay, Virginia, and Barnegat Bay, New Jersey (with Nicoletta Leonardi U. Liverpool), USGS, 09/01/16-08/30/21 \$275,000
21. LTER-Plum Island Ecosystems: Dynamics of coastal ecosystems in a region of rapid climate change, sea level rise, and human impacts. NSF through MBL, 10/01/16 - 09/30/22 \$139,449 (\$23000 per year)
20. Impact of hurricane Sandy on the salt marshes of Chincoteague Bay, Virginia, and Barnegat Bay, New Jersey, USGS, 01/01/14-12/31/15 \$99,903
19. Ecosystem evolution and sustainability of nutrient enriched coastal saltmarshes, (PI lead institution MBL) NSF, 03/15/14 - 02/28/17 \$108,262
18. Feedbacks between vegetation cover, hydrodynamics, and sediment transport in tidally dominated deltas: a remote sensing approach, ONR (PI with Curtis Woodcock) 01/01/14 - 12/31/16 \$ 221,799
17. LTER: Climate drivers, dynamics, and consequences of ecosystem state change in coastal barrier systems NSF (subcontract BU) 11/1/06-10/31/12 \$210,000
16. Evolution of Mouth Bars and Salt Marshes in Deltas: Implications for Sedimentary Deposits and Stratigraphy (PI), PRF, 01/09/2010-01/09/2013 \$100,000
15. Morphodynamics and Sedimentology of Tidal Bars in Deltas and Estuaries (PI) Exxon-Mobil 11/22/2009-11/23/2010 \$199,595
14. Tidal Dynamics and Muddy Substrates: A Comparison Between A Wave Dominated and A Tidal Dominated System (PI) ONR 11/1/09-10/31/2011 \$83,266.
13. Margins Post-Doctoral Fellowship: A Synthesis Model for the Fly River Dispersal System, Papua New Guinea NSF-OCE 4/2/2010-3/31/ 2012 (PI) \$187,509
12. Ebc Collaborative Research: Feedbacks Between Nutrient Enrichment and Intertidal Sediments; Erosion, Stabilization and Landscape Evolution NSF-OCE-EAR (PI with R.W. Fulweiler and D.C. FitzGerald) 09/01/2009-08/31/2012 \$897,134
11. Quantifying the variations of salt marsh area in the intertidal zone produced by climate change (PI with Wiberg, McGlathery U Virginia), DOE-NICCR BU) 10/1/06 09/30/09 \$164,413

10. Predicting the evolution of tidal channels in muddy coastlines (PI) ONR 10/1/06 09/30/09 \$163,472
9. Long-Term Ecological Research On Disturbance, Succession, And Ecosystem State Change At The Virginia Coast Reserve: VCR LTER V, NSF (subcontract BU) 11/1/06-10/31/12 \$119,982
8. Modeling the Morphology and Stratigraphy of the Northwestern Shelf of Florida, The Petroleum Research Fund (PI) 09/01/05 – 08/31/07 (Grant 42633-G8) \$35,000
7. ACS PRF SUMMER RESEARCH FELLOWSHIP Modeling the Morphology and Stratigraphy of the Northwestern Shelf of Florida, (PI with Houser U West Florida) 05/01/2006 09/01/2006 \$8000
6. Small Grant for Exploratory Research: Channel Incisions Produced by Tsunami Waves along the Coasts of Indonesia and Thailand, NSF (PI) 05/01/05 - 04/30/06 \$14,717
5. Collaborative Research: Modeling sediment delivery and related stratigraphy in a tidal dominated delta, the Fly River, Papua New Guinea, SPECIAL FOCUS INITIATIVE: Source-to-Sink Experiment (S2S), NSF, (PI, with Overeem, Peckham (Colorado) 05/01/05-04/30/07 \$69,330
4. Modellazione matematica e fisica di alcuni processi di sedimentazione nella Laguna di Venezia (linea 3.14) “Mathematical modelling of some sedimentation processes in the Venice Lagoon” Italian Agency Co.Ri.La. \$4,000.
3. Predicting Distribution and Properties of Buried Submarine Topography on Continental Shelves, Office of Naval Research 2004-2005 (PI), Budget Number: 2601-563-27-014400 \$23,801
2. Modeling Sedimentary Deposits on the Adriatic Continental Margin, EuroSTRATAFORM (with Niedoroda A., Reed C., Donoghue J., Stive M.) 2003-2004, (PI, subcontract FSU). Budget Number: 132367542 \$20,000
1. Modeling the Development of Tidal Channels in Wetlands, Florida State University FYAP (PI). Budget Number : 20038099 \$12,000