

8th Annual North Carolina Renewable Ocean Energy Symposium

Coastal Studies Institute
Wanchese, North Carolina
April 15-16, 2019

April 15

- 7:30 AM Registration and Breakfast (Rm 242)
- 8:00 AM Welcome and Introductions (Rm 262)
- 8:10 AM Expectations for the 7th Annual NC Renewable Ocean Energy Symposium
- Session I: Hydrokinetic Resource Assessment**
- 8:20 AM Gulf Stream Observational Resource Assessment - Mike Muglia, Patterson Taylor, and Nick DeSimone
- 8:45 AM Comprehensive Gulf Stream Ocean Energy Resource Assessment Using an Integrated Observing and Modeling Approach - Rouying He and John Bane
- Session II: Human Dimensions and Environmental Impacts**
- 9:15 AM Human dimensions of marine and hydrokinetic energy development off the NC coast: The role of values and attitudes in the social acceptability of a new use of marine space - Linda D'Anna
- 9:40 AM An integrative and holistic environmental and ecological assessment of the Gulf Stream current environment of the coast of Cape Hatteras, NC - Lindsay Dubbs, Michael Piehler, Larisa Avens, Steve Lockhart, Jinchun Yuan, and Rouying He
- 10:05 AM Dynamically Coupling the Impact of Marine Hydrokinetic Devices on the Wave Field and Sediment Transport - Alejandra Ortiz
- 10:30 AM Student Poster Session (Room 250)
- 12:00 PM Lunch (Rm 242)
- Session III: Expanding MHK Research and Education Capacity**
- 12:45 PM Energy Harvesting from Ocean Waves through Education and Research - Michael Atkinson
- 1:10 PM Jennettes Pier Wave Energy Test Facility - Mike Muglia and Lindsay Dubbs
- Session IV: Innovative System Components: Development and Optimization**
- 1:40 PM Liquid Crystal Thermoset Composites for Marine Energy Harvesting - Mark Pankow and Theo Dingemans
- 2:05 PM A Hermetically Sealed Magnetically Geared Marine Hydrokinetic Generator - Wesley Williams and Jonathan Bird

2:30 PM	Evaluating Magnetic Gearboxes under Failure Scenarios from Jennette's Pier Wind Turbines using Computational Fluid Dynamics - Wesley Williams and Navid Goudarzi
2:55 PM	<i>Break (Rm 242)</i>
3:10 PM	Developing North Carolina Manufacturing for Source Laminated Steel Parts for use in Magnetic Gear Assemblies - Wesley Williams
3:35 PM	Advanced Control, Prognostics and Health Management (PHM) for WEC Systems Using Heterogenous Underwater Communication Network - Tiefu Zhao and Tao Han
4:00 PM	Dynamic Modeling and Optimal Control of Three-Dimensional Ocean Current Turbine Arrays in Realistic Gulf Stream Turbulence Environments - Chris Vermillion, Praveen Ramaprabhu, and Mike Muglia
4:25 PM	Tethered Coaxial Turbines for Hydrokinetic Energy Harvesting - Kenneth Granlund, Andre. O. Mazzoleni, and Matthew Bryant
4:50 PM	Questions and Discussion
5:20 PM	Adjourn
5:45 PM	<i>Reception (Avenue Grille, Manteo, NC): Student poster session and cash bar at 5:45 PM and dinner at 6:30 PM</i>

April 16

8:30 AM Reconvene - coffee in rm 250

8:45 AM Keynote

Session V: Electrical Interface and Power Transmission

9:45 AM Hybrid High Voltage AC/DC System Protection and Controls for Interfacing Off-Shore Power Generations with On-shore Grid - Madhav D. Manjrekar and Badrul Chowdhury

10:10 AM Design of Medium Voltage Direct Current (MVDC) Circuit Protection and Coordination System for Voltage Source Converter Dominated Wave Energy Based Coastal Microgrids - Iqbal Hussain, Cheng Peng, Leonard White, Landon Mackey, and Md Rifat Kaisar Rachi

Session VI: Energy Storage

10:40 AM Optimal Techniques for Near-isothermal Compression and Expansion using Liquid-Piston - Paul Ro and Jun Liu

11:05 AM Optimal Sizing and Operation of HESS (Hybrid-Energy-Storage System) for Integration of Multiple Wave Energy Conversion (WEC) Systems - Subhashish Bhattacharya

11:30 AM *Lunch (Rm 242)*

Session VII: Mooring and Anchoring

12:15 PM Analyses for Instability of MHK Structure on Sloping Seabed Coupled with Evolving Morphology due to Sediment Transport - M.S. Rahman, Alejandra Ortiz, and M.A. Gabr

12:40 PM Structural Health Monitoring of Micropiles for Anchoring Marine Hydrokinetics off the North Carolina Coast - Mohammad PourGhaz

1:05 PM Load Capacity Model and Durability of Micropiles Anchoring Marine Hydrokinetic Device - Mo Gabr, Roy Borden, and Mohammad PourGhaz

1:30 PM Bio-mediated Soil for Mitigation of Scour at Foundation Supporting Marine Hydrokinetics Devices - Brina Montoya, Mo Gabr, and Jinung Do

1:55 PM Questions and Discussion

2:30-3:30 PM Technical Advisory Committee meeting (Rm 242)

2:30-3:30 PM Break out: Interactive Researcher Session

3:30 PM Report out and discussion (poster session winners announced)

4:00 PM Adjourn