



INORE

The International Network on Offshore Renewable Energy

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Overview

- INORE Overview
- INORE “Tools”
 - Website
 - Collaboration Incentive Scholarships
 - Workshops
 - Symposia
- INORE Members and Their Research
- INORE Sponsors
- Future Plans



What is INORE?

- The International Network on Offshore Renewable Energy
- Started as a dream of four students at NTNU in 2007
 - “to realize the potential of young researchers and offshore renewable energy through networking”
- International network of graduate students and early stage researchers in offshore renewables (tidal, wave, wind, OTEC, etc.)
- Provide a knowledge sharing platform
- Support collaborative research



INORE Steering Committee

- Yearly elections fill the 7 member steering committee
 - Elected among members at the yearly symposium
 - Two members stay on each year for continuity
 - Current Committee: 3 from UK, 1 from Denmark, 1 from Portugal, 2 from US
- Organize all events
- Secure sponsorships
- Promote INORE





How INORE works

- “Budget” is reliant completely on sponsorship
- Our growth is due to our members’ commitment, the academics who support us, and our sponsors
- Our Tools
 - Website (www.inore.org)
 - ICIS
 - Workshops
 - Symposia



INORE Website

www.inore.org

- Member search—allows for interaction between members
- News—any INORE or industry related news
- Events—INORE events, as well as conferences, etc.
- Job Postings—posted by members and website administrator
- Grants—ICIS (International Collaboration Incentive Scholarships)
- Sponsors—all sponsors get advertising on our website
- WIKI—member posted article database
- Other information

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ICIS

- International Collaborative Incentive Scholarships
- Enhancing and encouraging collaboration opportunities for INORE Members
- Call for proposals once a year
- Scholarships given upon merit of proposals
- To help offset cost of presenting research at a conference or publication costs
- This year's ICIS grant
 - Collaboration between Andrew Zurkenden of Aalborg University and Scott Beatty of University of Victoria
 - Quantification of viscous drag forces on heaving point absorbers using experimental methods for implementation into a numerical model of a point absorber



INORE Workshops and Activities

- Workshops
 - 1 day events at EWTEC ('07, '09, '11) and ICOE ('08)
 - Key note speakers, presentations, and group activities
 - Have been in Europe, but we are looking for opportunities to have workshops in North America
- Networking events
 - At MTS Oceans Seattle ('10), and MREC ('11)



INORE Activities: Offshore Floating Wind Turbine Challenge

- Floating Wind Turbine Challenge (with MARIN)
 - Introduced in 2011
 - 24 hours to build a 1/100th Scale Floating Wind Turbine
 - 25 Participants, broken into 7 teams
 - To promote creativity and teamwork, not develop/test new technologies
 - Continuing this year



INORE Activities: Offshore Floating Wind Turbine Challenge

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Annual Symposium

- INORE's flagship event
- Past symposia
 - Norway, Scotland, Belgium, England and Portugal
- 50-60 attendees
- Fully supported by sponsorships
- No cost to attendees other than getting to the "meeting point" before the symposium
- Keynote speakers, industry lead workshops, collaborative tasks, poster presentations



2011 Symposium

- Location: Alcoutim, Portugal
- Date: 9th-13th May, 2011
- Participants: 58 (all gave presentations)
- Institutions: 35
- Occupied the entire hostel
- Six key note speakers from industry
- Tutorials
 - Wind farm load calculation, performance and design (GL Garrad Hassan)
 - LabVIEW (National Instruments)
 - CFD
- Group research tasks





2012 Symposia

- Two symposia this year
- European Symposium in Thisted, Denmark (20-25 May)
- North American Symposium (17-21 June)
 - Supported by New England Marine Renewable Energy Center
- First time to have a North American Symposium



2012 North American Symposia

- To be held at Massachusetts Maritime Academy, Buzzards Bay, MA
- Advantages of holding the symposium at an academic institution:
 - Lab facilities—wind turbine, solar panels, geothermal heating/cooling, ADCP demonstration
 - Resources—professors and staff
 - Logistics—accommodations, facilities, catering, etc.
- Disadvantage
 - Restrictions on the time of year that the symposium can be held
- Strategy for North American INORE Symposia going forward: Hold symposia at academic institutions



INORE Members Overview

- 787 Members, 385 full INOREans
 - Over 60 countries represented
 - 132 women, 655 men
- Graduate students and early stage researchers can become INOREans
- Anyone else can join INORE
- Range of research interests
 - Tidal
 - Wave
 - Wind
 - Ocean Thermal
 - Ocean Biomass
 - Ocean Current



INOREan Research: Wave

- Build a novel wave generator to allow for a reliable physical model of an ocean wave to be resolved quicker than traditional wave-makers
- Evaluation of wave data from Ireland (Belmullet, Loop Head, Gallway, etc.) for site characterization
- Optimizing the shape of point absorbers by integrating viscous drag into a dynamics modeling code set



INOREan Research: Tidal

- Modeling of tidal arrays in ocean models
- Study of turbine-wake and wake-wake interaction to maximize power generation of tidal turbine arrays
- Optimization of oscillating foils, and prototype development for installation



INOREan Wind

- Investigation of modified generator systems (variable electromotive-force generator) for integration into wind turbines
- System and power engineering of combined offshore wind and wave energy farms with respect to their grid integration
- Study of the factors that lead to community acceptance of wind energy projects



INOREan Research: Misc.

- Environmental Impacts
 - Evaluating the effects of tidal power development on fish, and applying the method to the ORPC tidal installment in Cobscook Bay, Maine
 - Establishing a species inventory for a proposed MHK pilot project site to establish a baseline in the Puget Sound
- Ocean Thermal
 - Resource assessment off the coast of Colombia
 - Characterization of the global quantity and geographic distribution of OTEC resources



INOREan Research: Misc.

- Others
 - Evaluating the potential for osmotic power off the coast of Colombia
 - Modeling the flow through and downstream of a tidal barrage
 - Resource assessment of the hydrokinetic potential of the Florida Current
 - Investigation of the critical non-technical factors affecting the development and deployment of the UKs emerging wave energy industry
 - Marine renewable energy law



INORE Sponsors

European Symposium Sponsors

- MARIN
- Wavetrain2
- Tecnalia
- Wave Star
- Spok ApS
- Aalborg University
- Bosch Rexroth
- Vattenfall
- Ocean Energy Systems
- Dong Energy



INORE Sponsors

North American Symposium Sponsors

- New England MREC
- Teledyne RDI
- Resolute Marine
- NortekUSA
- Ocean Renewable Energy Group (OREG)
- Marine & Oceanographic Technology Network (MOTN)
- SNMREC, NNMREC



INORE Future Plans

- Expand our membership
- New steering committee will get elected at the European and North American Symposium
- Start planning next year's symposia
 - One in Europe and North America
 - Potential for North American Symposium at Acadia University
 - Discussing options with Joel Culina and Justine McMillan
- Looking at workshop and networking events to coordinate with different conferences



Conclusion

- Check out the website (www.inore.org)
- Join INORE (it's FREE)
- Sponsor INORE
- If you have any further questions contact Alana Duerr at info@inore.org
- Looking for new members and new sponsors



Thank you.

Alana Duerr

INORE Steering Committee

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