

Qualifications Summary:

- Over 36 years' experience working on ocean renewable energy systems, including offshore wind, wave power, tidal current energy, and ocean thermal energy conversion
- Research focus on ocean wave energy and offshore wind resource assessments, metocean extreme event analysis, ocean test site development, and energy cost modeling
- More than 7 years' experience working closely with state and federal permitting agencies and maritime stakeholder communities to assist Virginia in siting the state's offshore wind commercial lease area and two research lease areas

Education:

Degree	Year	Institution	Major Field of Study
<i>Master of Science</i>	<i>1980</i>	<i>Univ. North Carolina Chapel Hill</i>	<i>Marine Sciences</i>
<i>Bachelor of Science</i>	<i>1976</i>	<i>Univ. North Carolina Chapel Hill</i>	<i>Zoology</i>

Relevant Work Experience:

2000-Present Virginia Tech Senior Research Associate

Member of the front-end engineering design team for the Virginia Offshore Wind Technology Advancement Project led by Dominion Virginia Power, funded by DOE in 2012-2016.

Director of Research for the Virginia Coastal Energy Research Consortium, coordinating work at five state universities evaluating the cost of offshore wind energy and characterizing Virginia's offshore wind development potential, including supply chain and job creation. Principle author of *Virginia Offshore Wind Studies, July 2007 to March 2010, Final Report*.

Has served on the Virginia Intergovernmental Offshore Renewable Energy Task Force since it was established by the Minerals Management Service (now BOEM) in December 2009.

Principal Investigator (PI) on the first DOE-funded US wave energy resource assessment, managed by EPRI in 2009-2011. Updated that assessment with a more comprehensive and fully directional analysis in a DOE-funded, NREL-managed project in 2014-2016

Lead oceanographer for Electric Power Research Institute (EPRI) techno-economic feasibility studies of ocean wave energy in 2004 and tidal in-stream energy in 2005-2006. Responsible for resource assessments, site characterizations, and identification of environmental concerns in six states (HI, CA, OR, WA, MA, ME) and two Canadian provinces (NB and NS).

1986-1997 SEASUN Power Systems President and Owner

With SBIR funding from the National Science Foundation in 1990-1992, conducted numerical and physical modeling of a shallow-water, pivoting-flap, wave-powered desalination system.

Conducted regional wave energy studies for private utilities and state organizations in California, Hawaii, Virginia, and North Carolina.

1980-1985 Gibbs & Cox, Inc. Project Engineer

Worked on ocean engineering support contracts for the first DOE Ocean Energy Program, including analysis of ship-reported wave observations for ocean wave energy site selection.

Selected Publications, Presentations, Posters and Reports:

1. Bushnell, M., J. Hanson, and G. Hagerman, 2016. "Wave Measurement and Forecasting for Mid-Atlantic." *Sea Technology*, Vol. 57, No. 12, pp. 33-36. Arlington, VA: Compass Publications.
2. Balitsky, P. and G. Hagerman. "Wave climate analysis for scaled test sites off the US West Coast". *Proceedings 11th European Wave and Tidal Energy Conference (EWTEC2015)*, Nantes, France, 6-11 Sep 2015.
3. Balitsky, P., and G. Hagerman. "Preliminary Assessment of Wave Energy Resources and Design Conditions at Four Proposed U.S. Test Sites." Poster, 5th International Conference on Ocean Energy (ICOE), Halifax, Nova Scotia, Canada, 04-06 November 2014.
4. Hagerman, G., 2014. "Hurricane and Nor'easter Design Conditions for Mid-Atlantic Wind Energy Areas" at the DOE and BOEM Workshop on Offshore Wind Energy Standards and Guidelines: Metocean-Sensitive Aspects of Design and Operations in the United States, Arlington, VA. http://usmodcore.com//content/file/Hagerman-George_Hurr-NEasterDesign_BSEE672.pdf
5. Hagerman, G., M. Forte, J. Hanson, P. Vickery, S. Banik, J. Blanco, and L. Atkinson, 2014. *Development of an Integrated Extreme Wind, Wave, Current, and Water Level Climatology to Support Standards-Based Design of Mid-Atlantic Offshore Wind Projects*. 176 pp. TAP Project #672. U.S. Bureau of Safety and Environmental Enforcement, Herndon, VA. www.bsee.gov/research-record/tap-672-development-integrated-extreme-wind-wave-current-and-water-level-climatology
6. Hagerman, G. (principal author), 2011. *Mapping and Assessment of the United States Ocean Wave Energy Resource, Final Report*. 176 pp. Electric Power Research Institute, Palo Alto, CA. <http://www1.eere.energy.gov/water/pdfs/mappingandassessment.pdf>
7. Hagerman, G. (principal author), 2010. *Virginia Offshore Wind Studies, July 2007 to March 2010, Final Report*. 67 pp. Old Dominion University, Norfolk, VA. www.offshorewindhub.org/resource/1017
8. G. Hagerman, "Wave energy systems for recharging AUV energy supplies," *Proceedings of the 2002 IEEE Oceanic Society Workshop on Autonomous Underwater Vehicles*. pp. 75-84.

Synergistic Activities

Served on the National Academies Committee on Offshore Wind Energy Turbine Structural and Operating Safety Board in 2010, which produced a report titled Structural Integrity of Offshore Wind Turbines – Oversight of Design, Fabrication, and Installation, Transportation Research Board, Washington, DC. <http://onlinepubs.trb.org/onlinepubs/sr/sr305.pdf>

Regularly briefs federal and state legislative bodies and regulatory agencies on ocean renewable energy technology status and development potential. In May 2009, the Minerals Management Service (now the Bureau of Ocean Energy Management) recognized this service with an Offshore Leadership Award. www.vtnews.vt.edu/articles/2009/05/2009-387.html