Collegiate competitions provide students with real-world experience and industry connections that will help them prepare for future clean energy careers. Pictured are the first-place winners of the 2023 Marine Energy Collegiate Competition. *Photo from University of New Hampshire*

Collegiate Competitions Spark Curiosity and Careers in Water Power

Hydropower is the oldest renewable energy source, and marine energy may be the youngest. Regardless of whether they are old or young, both forms of water power will play a significant role in helping the United States reach a fully carbon-free energy sector by 2035. To meet the challenge, we need a strong water power workforce.

To inspire and grow a new generation of skilled workers to lead the country's energy revolution, the National Renewable Energy Laboratory (NREL) partners with the U.S. Department of Energy's Water Power Technologies Office (WPTO) to run two collegiate competitions—one for hydropower and the other for marine energy. Both provide undergraduate and graduate students with hands-on experience in each industry as well as the opportunity to devise innovative solutions to complex challenges that pave the way to a clean energy future.

NREL Gives Hydropower a Boost With Collegiate Competition

Launched in 2022, the Hydropower Collegiate Competition [https://americanmadechallenges.org/challenges/hydropower-collegiate-competition] invites interdisciplinary teams of undergraduate and graduate students to offer solutions to complex hydropower challenges. Participating teams develop a hydropower technology concept design, participate in several contests, and present their work at an industry event or conference. Through the HCC, students also gain industry experience, a window into hydropower career pathways, and greater knowledge of hydropower's potential to contribute to a clean energy future.

The 2024 HCC competitors represent both U.S. coastlines and several states in between. *Graphic by Jennifer Breen Martinez, NREL*

So far, recruited students from 16 universities across the country, including 5 minority-serving institutions, to participate. The competition, which runs the full academic year, is designed to attract a new set of skilled and diverse workers to modernize the U.S. hydropower fleet and position this renewable energy source as a keystone of a 100% clean energy grid.

Alongside the launch of the competition, NREL established the HCC Steering Committee. Consisting of 11 hydropower professionals from industry and government, the committee delivers educational presentations, provides feedback on the competition, and serves as mentors for the students.

Marine Energy Collegiate Competitors Set Sail to Victory

The Marine Energy Collegiate Competition [https://americanmadechallenges.org/challenges/marine-energy-collegiate-competition] challenges interdisciplinary teams of undergraduate and graduate students to offer unique solutions for growing the marine energy industry to embolden its vital role in powering the blue economy. This includes generating clean power for isolated coastal communities, underwater autonomous vehicles, biofuel processing plants, and more.

In five years, MECC has engaged students from more than 60 universities across the country and abroad, including 12 minority-serving institutions, a community college, and a handful of international institutions. MECC organizers not only aim to advance promising marine energy technologies, they also hope to boost student interest in the marine energy industry, expand marine energy's presence in academic curricula, and collaborate with industry partners to understand how to best prepare students to meet workforce needs.

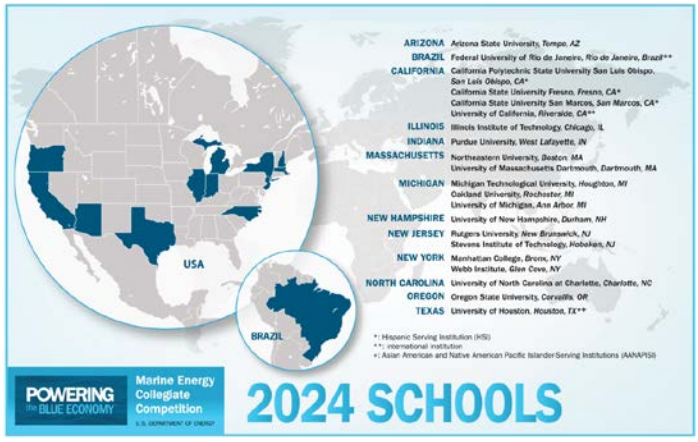
Competitions Set Participants Up for Success

The joint 2023 HCC-MECC Final Event [https://www.energy.gov/eere/articles/us-department-energy-announces-winners-2023-hydropower-and-marine-energy-collegiate] was held at National Hydropower Association's Waterpower Week 2023 and hosted 29 student-led teams (10 HCC and 19 MECC), faculty advisors, and industry judges. The HCC teams pitched their case studies, and the MECC teams pitched their business plans and detailed technology designs to panels of judges. All teams also presented their approaches to creating connections between industry and their local communities. Of the 19 MECC teams, all but one built and tested their designs in wave tanks. The final event offered an opportunity for students to meet industry members and potential employers and learn more about the hydropower and marine energy industries.

Students from across the country gathered at Waterpower Week 2023 in Washington D.C. for the 2023 HCC-MECC Final Event to show their concepts, engage with peers, and network with industry and potential employers. *Photo by Taylor Mankle, NREL*

Collectively, MECC and HCC have involved 21 minority-serving institutions, including historically Black universities and colleges, Hispanic-serving institutions, and Asian American and Native American Pacific Islander-serving institutions. NREL continues to obtain feedback and make improvements to the competitions to consider diversity, equity, inclusivity, and accessibility.

HCC and MECC alumni have directly benefited from participating in the competition. Through MECC, four alumni have secured jobs with ocean energy companies; one earned a prestigious U.S. Department of Energy Oak Ridge Institute for Science and Education fellowship; and 11 received internships with national laboratories. Because these statistics are based on alumni who report their job status, the number of participants who secured jobs is likely higher. And, as the marine energy industry grows and the hydropower industry evolves,[1] job opportunities will continue to increase.



In 2023, NREL welcomed the fifth wave of marine energy innovators to the MECC. *Graphic by Jennifer Breen Martinez, NREL*

More information

HCC contacts:

Arielle Cardinal
Arielle.Cardinal@nrel.gov

Bree Mendlin
bree@hydrofoundation.org

Elise DeGeorge
Elise.DeGeorge@nrel.gov

Betsy Stratton
Betsy.Stratton@nrel.gov

MECC contacts:

Arielle Cardinal
Arielle.Cardinal@nrel.gov

Betsy Stratton
Betsy.Stratton@nrel.gov

[1] https://www.nrel.gov/docs/fy23osti/83817.pdf

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National Renewable Energy Laboratory
15013 Denver West Parkway, Golden, CO 80401
303-275-3000 • www.nrel.gov

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