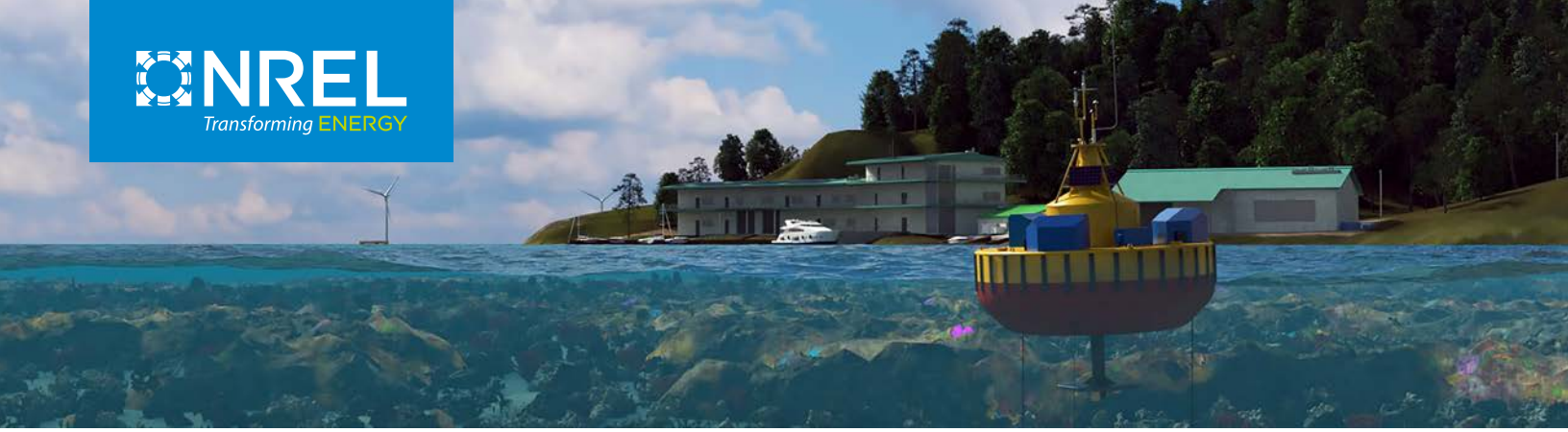

The water power industry holds great potential to provide jobs while bolstering our clean energy transition. *Illustration from IKM 3D*

Inspiring Tomorrow's Water Power Workforce To Lead the Clean Energy Revolution

Renewable water power, including hydropower and marine energy, will play a key role in building a reliable and flexible 100% clean energy future.

That future needs a larger, modern workforce—one that's more diverse, equitable, and inclusive—to power and improve these technologies. And researchers at the National Renewable Energy Laboratory (NREL) are committed to nurturing tomorrow's water power workforce through science, technology, engineering, and mathematics (STEM) and workforce development programs. Through events, online resources, and more, the lab aims to engage and inspire careers in water power.

Renewable Energy Discovery Island

To demonstrate water power's potential, NREL created Renewable Energy Discovery (REDi) Island, a series of educational, 3D animated videos of a virtual renewable-energy-powered island. Developed by IKM 3D and funded by the U.S. Department of Energy's Water Power Technologies Office (WPTO), REDi Island is designed to inspire K–12 to college-level students and people of all ages to join the clean energy revolution and turn this virtual energy utopia into a reality. Zooming into REDi Island, users can explore a diverse array of marine, hydropower, and river-based energy technologies and watch as they energize whole communities, power microgrids and offshore work, and turn salt water into fresh drinking water—all with clean, reliable, renewable energy from moving waters.

NREL has published 14 animated water power demonstration videos:

- Aquaculture Arena (offshore fish farm)
- Bulge Wave Boulevard (bulge wave devices and battery bank)
- Cooling Concourse (seawater air conditioning)
- Desalination Station (desalination plant and surge flaps)
- Hydro Heights (pumped storage hydropower)
- Hydro Hollow (conventional dam)
- Hydrokinetic Haven (riverine energy generation)
- Navigation Network (navigation buoy)
- Power Up Point (wave-powered autonomous underwater vehicle charging)
- Research Reef (observation buoy)
- River Ramble (run-of-river bypass)
- Surge Flap Sands (large surge flap array)
- Tidal Town (tidal turbines)
- Windy Way (offshore wind)

NREL launched an interactive, browser-based REDi Island application so schools, museums, and other programs can integrate this valuable educational resource into their curricula. Follow REDi Island [https://www.nrel.gov/water/redi-island.html] to learn about water power technologies and stay updated on new developments.

Some of REDi Island's animated videos include (from left to right): Research Reef (observation buoy), Tidal Town (tidal turbine), Surge Flap Sands, and Navigation Network (navigation buoy). *Illustrations from IKM 3D*

NREL's STEM team joined WPTO and other STEM partners in Washington, D.C., at Waterpower Week 2022. *Photo courtesy of National Hydropower Association*

Workforce Resources and Tools

Hydropower and marine energy will play a key role in integrating more renewable energy sources into the grid and nudging the country closer to its aggressive climate and clean energy goals. To fill this critical role, NREL's STEM project aims to address workforce challenges and attract new talent.

NREL published the U.S. Hydropower Workforce: Challenges and Opportunities[1] report in 2022 to provide an updated analysis of hydropower workforce trends based on data collected by NREL, WPTO, the Hydropower Foundation, and members of the hydropower industry. NREL also released hydropower[2] and marine energy[3] career maps to familiarize students and professionals with potential careers in these growing industries.

NREL's Marine Energy Collegiate Competition[4] and Hydropower Collegiate Competition[5], co-led by the Hydropower Foundation, challenges undergraduate and graduate students to develop solutions to complex industry issues. Collectively, the competitions have engaged nearly 70 institutions, including minority-serving institutions, international universities, and a community college, and helped dozens of students join the water power workforce.

NREL demonstrated the career maps to industry and national lab stakeholders at Clean Currents 2023. *Photo by Vern Slocum, NREL*

[1] https://www.nrel.gov/docs/fy23osti/83817.pdf
[2] https://www.energy.gov/eere/water/hydropower-career-map
[3] https://www.energy.gov/eere/water/marine-energy-career-map
[4] https://americanmadechallenges.org/challenges/marine-energy-collegiate-competition
[5] https://americanmadechallenges.org/challenges/hydropower-collegiate-competition

STEM Portals

NREL's STEM Hydropower Portal and STEM Marine Energy Portal offer resources for learning about water power technologies as well as potential career tracks, ensuring that training for tomorrow's workforce begins today.

The portals offer features for a variety of users: hydropower educators may look for new curricula and training materials; renewable energy students may explore career pathways to get inspired by water power professionals across diverse disciplines and skill sets; and young professionals may leverage networking events and job postings.

STEM Hydropower Portal

STEM Marine Energy Portal

More information

REDi Island contacts:

Arielle Cardinal
Arielle.Cardinal@nrel.gov

Betsy Stratton
Betsy.Stratton@nrel.gov

STEM Portal contacts:

Hanna Fields
Hanna.Fields@nrel.gov

Betsy Stratton
Betsy.Stratton@nrel.gov

Workforce Analysis and Resources contacts:

Arielle Cardinal
Arielle.Cardinal@nrel.gov

Bree Mendlin
Bree@hydrofoundation.org

Elise DeGeorge
Elise.DeGeorge@nrel.gov

Betsy Stratton
Betsy.Stratton@nrel.gov

Jennifer Daw
Jennifer.Daw@nrel.gov

NREL Transforming ENERGY

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

NREL prints on paper that contains recycled content.

NREL is a national laboratory of the U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Operated by the Alliance for Sustainable Energy, LLC

NREL/FS-7A40-88512 • January 2024