



SCRIPPS INSTITUTION OF OCEANOGRAPHY HYDROGEN HYBRID RESEARCH VESSEL

ACCELERATING MARITIME DECARBONIZATION

Scripps Institution of Oceanography at UC San Diego is developing a new research vessel to chart a bold course for the future of our ocean planet.

The California Coastal Research Vessel (CCRV) will use first-of-its-kind technology to present a viable, timely vision for decarbonizing the maritime sector. Dedicated to research, education and training missions, this zero-emission hybrid vessel will help protect California's coastal environment from climate change impacts while demonstrating hydrogen's critical role in our carbon-free future.

CCRV will feature an innovative hydrogen fuel cell propulsion system that will allow it to conduct 75% of its missions entirely using hydrogen with only pure water and electricity as reaction products. The liquid hydrogen will be produced from renewable resources, as it is crucial to reduce CO² emissions and air pollution to the fullest extent possible across the entire hydrogen value chain. This vessel's technology will be proof of concept for scientists, students, policymakers and the maritime industry as we work to decarbonize maritime transportation and logistics.

At UC San Diego, our undergraduate and graduate programs benefit from world-class learning facilities and experiences made possible by our research vessels. Providing seagoing experiences for students and early-career scientists is a distinguishing priority of UC San Diego and Scripps Oceanography. As a world leader in operating broadly-capable research vessels, Scripps Oceanography continues to set the standard for exceptional maritime innovation in support of seagoing research operations.

At UC San Diego, we believe that what we don't know today will forever change our tomorrows. Empowered by generosity and fueled by curiosity, we are unafraid to chase the unknown — to ask the questions no one has asked before and to push the boundaries of possibility. Together, we unite diverse people and unconventional perspectives to propel limitless impact. Because we know that when we come together, nothing is beyond us.

FOUR

Number of research vessels in the Scripps Oceanography fleet

164 FEET

Design length of CCRV

500+

Students will go to sea on CCRV each year

32,400 GALLONS

Amount of diesel fuel that CCRV will replace with clean hydrogen each year



BENEFITS OF MARITIME INNOVATION

Carbon neutrality in maritime operations. Conventional diesel-powered ships contribute significantly to greenhouse gas emissions, air pollution, and the risk of oil spills. A pair of thorough feasibility studies have shown that battery power is not viable for oceangoing ships. CCRV's hydrogen technology and system integration will safely and effectively deliver emission-free power that will have broad applicability in the maritime industry. As a bold, first-of-its-kind oceangoing vessel, CCRV will provide compelling proof of concept for maritime hydrogen power. The adoption of this technology will have far-reaching impacts, including new market opportunities and reduced emissions from shipping.

Eliminating pollution and noise. This project has been endorsed by the San Diego Portside Environmental Justice Committee and Port of San Diego for its zero-emission operating profile when in bay or coastal environments. Clean hydrogen will offset the combustion of 32,400 gallons of diesel fuel per year, which will eliminate 330 metric tons of CO² emissions annually. In addition, fuel cells are inherently quieter to operate than diesel engines, and CCRV will significantly reduce underwater radiated noise, which allows for natural observations of marine life.

Capacity for research and education. CCRV will be a major asset within the U.S. Academic Research Fleet and will carry more than 500 undergraduate and graduate students to sea each year. Hundreds more research scientists from across the country will deploy on board in support of missions involving federal, state, and nongovernmental science agencies.

Vital to the University of California mission. CCRV reflects the University of California's commitments to environmental stewardship and scientific research. University of California researchers are leaders in understanding societally relevant processes in biological, chemical, geological and physical sciences. The cross-disciplinary research conducted aboard CCRV will have profound implications for the reduction of global climate risk and the economic vitality of California.

PIONEERING A NEXT-GENERATION VESSEL

With \$35 million in state funding allocated and its preliminary design approved by the American Bureau of Shipping, CCRV's development is progressing. Your philanthropic support at any level is vital for supporting its remaining development, including construction and initial operation. Together, we will make this vision for the future of oceanographic research and the maritime industry into reality.

With your philanthropic support, we can continue our work to understand and protect the planet by investigating our oceans, Earth and atmosphere to find solutions to our greatest environmental challenges.

Learn more at scripps.ucsd.edu.

For more information on supporting the California Coastal Research Vessel, please contact:

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